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OPHTHALMOSCOPE

A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

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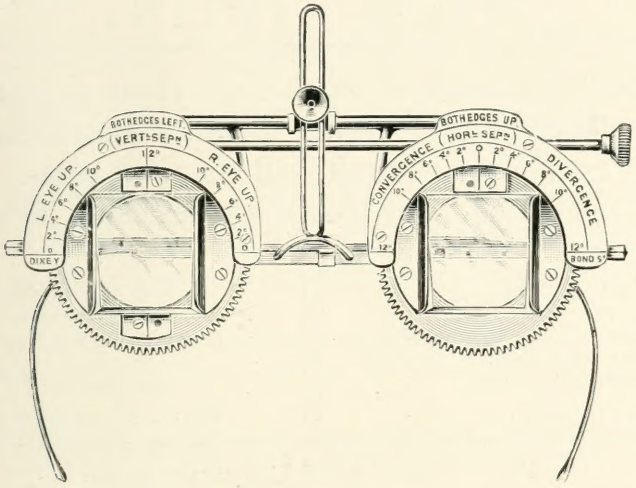

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THE

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A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

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ORIGINAL COMMUNICATIONS.

RUPTURE OF THE PECTINATE LIGAMENT.

BY

LESLIE BUCHANAN, M.D.,

SURGEON TO THE GLASGOW EYE INFIRMARY.

Although the number of cases of injury of the pectinate ligament which have been recorded is comparatively small, it is likely that the lesion is more frequent than the records would indicate. It seems probable that a more comprehensive discussion of the subject than has yet been undertaken would, in view of the grave prognostic significance of the lesion, lead to its being more thoroughly studied.

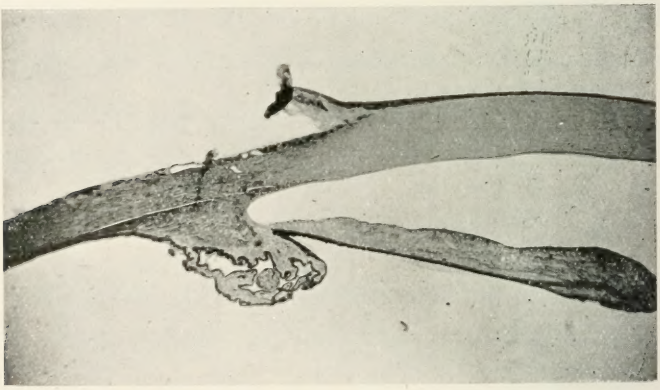

FIG. 1.—Radial section of anterior segment of a normal human eye. To show the position of parts compared with Figs 2 and 3. The line of contact of the sclera and ciliary body and the end of Descemet's membrane are well shown. × 9.

In order to make the subject more clear it will be necessary to define, somewhat carefully, the precise nature of the lesion from the anatomical point of view.

The Ligamentum Pectinatum Iridis, or, simply, the pectinate ligament, is the true tendon of the ciliary muscle (Fig 1). It extends radially forwards and centrally from the ciliary muscle to be inserted at the periphery of the cornea at its posterior surface. It is composed of fibrous tissue loosely arranged in somewhat conical shape, and the spaces between the interlacing fibres form the so-called "spaces of Fontana," the posterior wall of the canal of Schlemm being formed by the ligament.

It is, further, well recognised that the external surface of the ciliary body has but slight connection with the inner surface of the sclera and that during the act of accommodation, when the ciliary muscle is contracting, the former slides to some extent on the latter. On tracing the line of contact of these two surfaces forward it will be found to point almost exactly to the canal of Schlemm, since the ligament forms, as above mentioned, the posterior wall of the canal. Hence, it will readily be understood that if the ligament be ruptured, thus opening the canal directly into the anterior chamber, there is practically nothing to keep the ciliary body in its position and that, in consequence of its natural elasticity, it will slip away from the corneal margin either outwards or backwards and outwards. Rupture of the pectinate ligament, therefore, practically implies displacement of the ciliary body.

Lastly, in this connection, it will be seen that as the ligament reinforces the sclera at its weakest point, rupture of the former is to be regarded as partial rupture of the latter.

Nature of the injury producing the lesion.—Rupture of the pectinate ligament is usually a result of a blow with a blunt object, which indents the eyeball. Many other varieties of injury, however, may produce such a lesion in a greater or less degree; and here it must be noted that in many, if not most, cases of rupture of the sclera the pectinate ligament is also ruptured.

In March, 1903, I recorded* five instances under the title of "Traumatic separation of the ciliary body, due to rupture of the pectinate ligament," in which the lesion was caused by various injuries, and to those I have now to add as causes a blow from a fist and a blow from a broom-handle. In four of the seven cases the globe was *not* completely ruptured.

The pathological result of the lesion. — As before indicated, the result of the tearing of the pectinate ligament is that the ciliary body is no longer attached at the corneo-scleral margin, and either slips back along the sclera or, if a large peripheral extent of the ligament has been torn, may fall back into the vitreous chamber. I have seen degrees of rupture, varying in extent from one-sixth to nearly one-half of the corneal circumference.

Another result of the lesion is the occurrence of hæmorrhage into the anterior chamber, owing to tearing of some of the small vessels which pass from the ciliary body to the sclera. The hæmorrhage usually extends along the space formerly occupied by the ciliary body and between this structure and the sclera.

* *Trans. Ophthalmological Society of the United Kingdom*, Vol. XXIII, 1903, p. 283.

In all cases, as would be expected, there is some degree of laceration of the ligament of the lens and consequent dislocation of the latter.

It is probable that the tearing open of the canal of Schlemm has a very important bearing on the result of the lesion, for it is

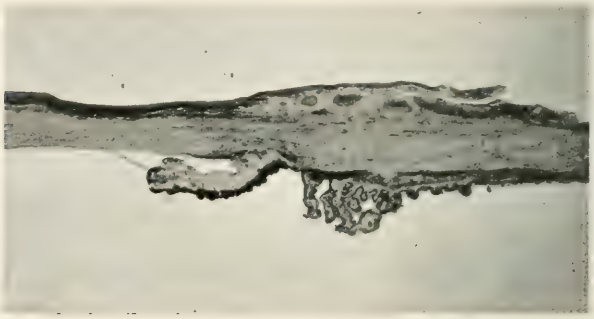

FIG. 2.—Radial section of the anterior segment of a human eye in which a small rupture of the pectinate ligament had occurred. The ciliary body has slipped outwards along the sclera for 1mm. and become fixed. The iris is pressed forward into the gap formed by the opened canal of Schlemm. × 9.

generally found that the canal ultimately becomes obliterated, and in this way conduces to the production of a state of glaucoma.

In addition to these more important results, it is to be

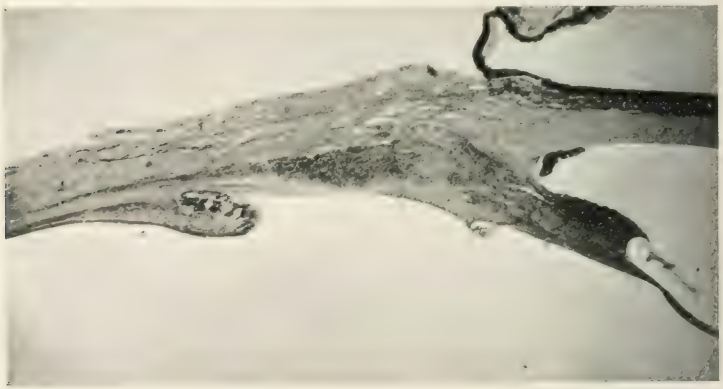

FIG. 3.—Radial section of the anterior segment of an eye in which an extensive rupture of the pectinate ligament had occurred. Iridodialysis.

Ciliary body displaced back and outwards and lying separated from the sclera but partially attached to it by fibrous tissue.

Large mass of semi-organised blood clot covering the denuded area of sclera. × 9.

expected that other effects of injuries with blunt objects may occur in connection with cases of this description, such as rupture of the iris, hæmorrhage into the vitreous, etc.

Lastly, it is important to notice what happens to the ciliary body which has become displaced. If it has been simply moved along the sclera for a short distance, and remains applied to the inner surface of that structure, it is almost certain to become fixed in its new position by fibrous tissue (Fig. 2). If, on the other hand, it has fallen back into the vitreous chamber, as it were, it has less chance of becoming completely fixed, and may hang free at its central part whilst the peripheral part is fixed (Fig. 3). In all cases seen the ciliary body at an early stage began to atrophy, while in some the globe was beginning to shrink.

Clinical appearances.—The clinical appearances of the condition vary much in accordance with the extent of the lesion and change according to the time which has elapsed since the accident.

When seen immediately after the injury, the presence of blood in the anterior chamber usually completely masks the characteristic appearances. Later, when the blood is absorbed, it will be found that the anterior chamber is of uneven depth, and that the pupil is no longer circular.

If the extent of rupture is small it will be found that the pupil is displaced to one side, and that, whilst the pupillary margin *is visible all round*, the condition somewhat simulates a coloboma.

There is, however, the difference in depth of the chamber to aid in making the distinction, for in this condition the iris is usually pushed forwards, so that the pupillary margin lies close to the cornea at the part where the apparent coloboma is.

If a large extent of the ligament is torn, the clinical appearances will be widely different, for (*a*) the iris may be separated from the ciliary body, in which case the diagnosis can only be made when the media are clear enough to allow of the ciliary body being seen lying like a dark shadow behind the sclera ; or (*b*) the iris may retain its attachment to the ciliary body and be carried back with it into the new position which it has taken up. In this event the anterior chamber will be very deep at the side where the injury has occurred.

In some cases there is extreme mydriasis at a comparatively early stage, and this must not be confused with the similar state which supervenes later in consequence of atrophy of the iris. Generally, the pupillary margin is visible all round until three or four weeks after the injury, when, owing to long continued pressure, as a rule, the iris becomes atrophic.

It must be remembered that one or more other lesions which

may arise from violence applied by blunt objects may occur in such cases and greatly complicate matters.

In all cases there is, from the beginning, a great deal of pain, due, often, to increased tension and, possibly, to traction on the ciliary body. When the media clear up to some extent the lens may be looked for in the vitreous chamber, where it is usually lying on the ciliary body below.

The visual power is greatly diminished, largely owing to opacity of the media in the early stages, but, later, when continued high tension has given rise to atrophic changes, even although the opacity has then cleared up almost completely, and the fundus is easily seen, the vision will amount to hand-movements only.

Diagnosis.—It will be apparent from the foregoing remarks that it is not always easy to make a definite diagnosis of rupture of the pectinate ligament, but the matter is so important from a prognostic point of view that it is advisable that the existence of the lesion should be recognised as early as possible. In cases where the sclera has been completely ruptured it is not, probably, so urgent as in the less severe cases, where only the displaced pupil and dislocated lens are striking features. In this latter class of case the added rupture of the ligament makes a great difference in the prognosis.

The principal points, then, which should be looked for are the altered position of the pupillary margin and the persistent high tension.

Prognosis.—As only eight cases of rupture of the pectinate ligament have been described, and in two of these only has the diagnosis been made before the eye was excised, it is not safe to state dogmatically an opinion as to the prognosis, but the pathological changes found are of such serious significance that a provisional opinion must be very grave. It is possible that the removal of the dislocated lens would relieve pain and that scleral puncture would relieve the tension, but as the canal of Schlemm is obliterated and the ciliary body tends to become atrophic, it will be understood that operative interference is only a forlorn hope. Experience has shown that the eye does not tend to improve and that the pain is very difficult to alleviate, as the tension remains high for a long time, except where the rupture is very large, in which case the atrophic changes set in correspondingly early.

ON THE TREATMENT OF ALTERNATING SQUINT.*

BY

R. J. COULTER, M.B., F.R.C.S.I.

OPHTHALMIC SURGEON, NEWPORT AND MONMOUTHSHIRE HOSPITAL.

The treatment of alternating squint is a subject to which very little attention is paid in ophthalmic text-books, while even in monographs on strabismus contradictory opinions are expressed with regard to it. Thus Worth[1] divides alternating squints into two classes: (*a*) squints which accidentally alternate because the refraction is about the same in each eye, but do not essentially differ from monolateral squints, and, in fact, tend to become monolateral if untreated; (*b*) essentially alternating squints in which there is usually no refractive error, and the visual acuity of each eye separately is, as a rule, perfect, but the patients have a congenital total inability to acquire fusion. He states that if the wearing of glasses does not cause the abnormal convergence to disappear an accurately performed operation will remove the deformity, but that the total absence of the fusion-sense renders a perfect cure of an essentially alternating squint impossible. Javal[2], on the other hand, states that, in cases of alternating squint in which the patient has sufficient leisure and intelligence, restoration of binocular vision can be rapidly obtained after the deviation of the eyes has been corrected or slightly over-corrected. In view of this difference of opinion, it seems to me worth while to record the following cases in which restoration of perfect binocular vision was obtained. With one exception, they appeared before operation to be typical examples of essentially alternating squint, as no fusion could be produced by any of the ordinary methods, but even if they belonged to the accidentally alternating class they differed from ordinary monolateral squints in the rapidity with which binocular vision was established in them at ages at which orthoptic treatment would, as a rule, be useless.

Case I. James C. W., age 14, was brought to me on January 30th, 1905, with a history that he commenced to squint as a result of a fright when four years old, and was taken to an ophthalmic surgeon one month later, who prescribed glasses, and as these did no good, suggested operation, which was refused by the patient's parents.

When first seen by me, the boy had an alternating convergent squint of 30°, the vision of each eye was normal, and under atropine there was hypermetropia 3·5D. in the right eye and

*Read at the Annual Meeting of the British Medical Association, Section of Ophthalmology, August, 1907.

2·75D. in the left. Glasses were prescribed, R.E. + 2·75 and L.E. + 2, and an attempt was made to develop the fusion-sense, with the result that, at the end of the month, there was good simultaneous vision but no fusion. I then determined to give up all hopes of obtaining binocular vision, and to operate with a view to producing a cosmetic effect, and on March 6th, 1905, I advanced the external and tenotomised the internal rectus of the right eye. When the bandages were discontinued the boy complained of diplopia, and on March 21st, on testing him with the amblyoscope, I found that he was able to fuse. He was told to practise at home with Kroll's and Dahlfeld's stereoscopic pictures, and carried out his instructions diligently, with the result that on March 28th he had good fusion and stereoscopic vision, and on April 15th, he had perfect stereoscopic vision and bar reading, and could tell when his eyes were straight, as he saw double when they squinted. I have not seen this patient for some time, but have made frequent enquiries, and have always been assured that the result remains perfect, the eyes being quite straight without glasses.

Case II. Rose M. M., age 14, came to the Newport and Monmouthshire Hospital on August 20th, 1906, giving a history that her eyes had been noticed to turn in for the previous eight years. On examination, she was found to have an alternating convergent strabismus of 30°.

Her vision was :—

R. eye, 6/18. Under homatropine, + 3 6/6.
L. eye, 6/24. ,, ,, + 3·5 6/6.

On August 28th. Right eye, tenotomy of internal rectus.

1907—Jan. 4th. Left eye, tenotomy of internal rectus.

January 14th. Double vision at times. With amblyoscope good fusion and stereoscopic vision.

March 11th. Patient sees double when her eyes are crooked, and can bring them straight. Does fusion tests and bar reading well, and does not require to wear glasses.

Case III. Beatrice V., age 10. First seen December 1st, 1902, when she was said to have squinted "for years" and worn glasses. R. eye + 1·5, L. eye + 2·5 for the previous 2½ years. On examination, she was found to have an alternating convergent squint, measuring 20° both with and without her glasses.

Her vision was—R. eye. Under homatropine + 3·5 6/5
L. eye. ,, ,, + 3·5 6/9

Glasses were prescribed : R. eye + 3·5, L. eye + 3, giving 6/9 in each eye when not under the influence of cycloplegics. The patient was not again seen until May, 1906, when she came saying that she had worn her glasses for two years and then

gave them up as she found they were no good. Tested with the amblyoscope she could see the bird and cage simultaneously, but could not get the bird into the cage.

1906—May 29th. L. eye—tenotomy of internal rectus.

June 16th. Eyes straight. Simultaneous vision, but no attempt at fusion.

July 17th. Has had training with the amblyoscope. Fusion well developed.

July 28th. Can do bar reading.

August 18th. Can do bar reading quite well, and gets double vision if her eyes are not straight. Does not wear any glasses.

Case IV. Ethel G., age 18. First seen February 5th, 1906, when she came to have her eyes (which had squinted from childhood) put straight. On examination, she was found to have an alternating convergent squint of 30°.

The vision was—R. eye 6/5. Under homatropine + 2 6/5.
L. eye 6/5. „ „ + 2.5 6/5.

With the amblyoscope the patient had simultaneous vision, but no fusion.

1906.—February 9th. L. eye—advancement external rectus, tenotomy internal rectus.

February 27th. With amblyoscope, fusion and stereoscopic vision.

March 8th. Still converges 10°. R. eye—tenotomy of internal rectus.

March 13th. Slight divergence, crossed diplopia.

March 20th. Eyes straight, slight diplopia at times, but usually binocular vision; bar reading good without glasses.

Case V. Edith P., age 13. First seen February 21st, 1906, when a history was given that she had squinted for ten years, and had worn glasses for long without benefit. On examination, she was found to have an alternating convergent squint of 30°.

Her vision was—R. eye 6/9. Under atropine + 3.5 6/6.
L. eye 6/6. „ „ + 4 6/6.

Glasses were prescribed R. and L. eyes + 3.5D, and orthoptic treatment was tried.

February 27th. With amblyoscope, momentary fusion.
March 1st. „ „ fusion good
March 27th. „ „ fusion and stereoscopic vision.
May 9th. „ „ good fusion but still intermittent squint.

R. eye—tenotomy of internal rectus.

May 26th. Can do bar reading for 10 minutes at a time.

June 16th. Can do bar reading for as long as she likes.

1907. June 17th. Eyes quite straight without glasses, and patient has binocular vision.

Remarks.—Although in some cases similar to those recorded, I have not succeeded in restoring binocular vision of such a quality as to keep the eyes straight, I have never failed to obtain fusion of stereoscopic pictures after correcting the deformity by operation, and I consider that in dealing with alternating squints which have become permanent, the best course (if the fusion-sense is not developed rapidly as in Case V.) is at once to correct the deformity by operation, but that in spite of the failure of previous orthoptic treatment, every effort should be made as soon as possible after operation to develop binocular vision by training with the amblyoscope or stereoscope.

The most suitable time for undertaking such treatment is when the patient is between 12 and 16 years old, as at this age time for the training can be better spared than later in life, while the patients are usually very keen on learning to see the stereoscopic pictures properly, and can consequently be allowed, to a large extent, to work out their own cure if supplied with a stereoscope and a set of suitable pictures.

References.

[1] Worth, Claud.—*Squint: its causes, pathology, and treatment*, 1903, pp. 30 and 31.

[2] Javal, E.—*Manuel théorique et pratique du Strabisme*, 1896, pp. 221 and 222.

A SERIES OF FOUR CASES OF INFANTILE GANGRENE OF THE CORNEA (KERATOMALACIA) IN WHICH THE SPIROCHÆTA PALLIDA WAS FOUND.

BY

Sydney Stephenson,

LONDON, ENGLAND.

It is singular that although the treponema pallidum has been found in syphilitic lesions in almost every part of the body, yet specific ailments of the eye appear to form almost an exception to the rule. At all events, few reports are to be found in literature concerning the treponema in those diseases, which are amongst the commonest affecting the eye. This paucity, however, is more apparent than real. It is due partly to the inaccessibility of the lesions, involving, as they mostly do, the deeper parts of the eye, and partly to the fact that ocular pathology has become almost as much a specialty as ophthalmic surgery itself, with the consequence that lesions of the eye do

not, as a rule, receive as much attention from the general pathologist as would otherwise doubtless be the case. At the same time there can be little doubt, if any, that in the eye, as elsewhere, the organism is the cause of all the so-called specific lesions with which we are clinically familiar.

If we glance for a moment at what has been done in the finding of the treponema in syphilitic affections of the eye this is what we find :—putting aside experimental syphilis in the eyes of apes, rabbits, and dogs as not exactly germane to the present subject, the number of observations so far placed on record can only be characterised as remarkably few. For example, the spirochæta pallida has been found in primary syphilitic sores of the eyelid by Kowalewski (*Klin. Monatsbl. f. Augenheilkunde*, 1905, Band II, p. 489) and by Chaillous (*Recueil d'ophtalmologie*, July, 1907) ; in chancre of the conjunctiva by Aubineau (*Annales d'oculistique*, July, 1907) ; in recent syphilitic papules of the iris by Kruckman (Axenfeld's *Die Bakter. in der Augenheilkunde*, 1907) ; in acute syphilitic irido-cyclitis by zur Nedden (*Ber. der Oph. Gesellschaft*, Heidelberg, 1906, p. 215) and myself (THE OPHTHALMOSCOPE, June, 1907) ; and, lastly, in keratomalacia by the present writer (THE OPHTHALMOSCOPE, March, 1907). That the foregoing list is a scanty one will be at once realised when it is considered how relatively common are specific affections of the eye.

The object of the present paper is to communicate the details of a series of four cases of keratomalacia, in all of which the treponema pallidum was found in scrapings from the necrotic corneæ when stained by appropriate methods.

For the benefit of readers it should, perhaps, be explained that keratomalacia is a grave affection of the cornea, apt to supervene in babies whose vital resistence has been seriously reduced by general illness, such as congenital syphilis, tuberculosis, or gastro-enteritis with ileo-colitis. It corresponds with "Hikan," a disease that appears epidemically in Japan during the three so-called "diarrhœa months," July to September ; with the South American "ophthalmia Braziliana ;" and with the destructive keratitis common in Russia during the great Lenten fast. Although few cases (not more than a dozen all told) have been reported in England, yet those attached to children's hospitals see the disease not very infrequently. In London, indeed, keratomalacia has a distinct seasonal incidence. Thus, on a particular date in September, 1905, I had no fewer than six cases under my care, namely, one at the Evelina Hospital and five at the North-Eastern Hospital for Children. The majority of the cases had resulted from ilio-colitis, a disease, as everybody knows, more or less epidemic in London during the months of June, July, and the early part of

August. It then diminishes in September and usually ends in October.

Cases of keratomalacia are characterised—first, by athrepsia, and, secondly, by a sloughing condition of one or both corneæ, associated with but slight symptoms of local reaction, such as redness, reflex blepharospasm, or swelling of the eyelids. Curious, dry, frothy-looking patches of xerosis, first described by von Graefe, may sometimes be found in the ocular conjunctiva. They are not essential to the diagnosis.

The necrosis of the cornea, contrary to what might be expected, is not due to any particular micro-organism. Practically any pyogenic microbe, other conditions being favourable, may cause keratomalacia. In my own cases I have found staphylococcus albus, aureus, and citreus, as well as pneumococcus, bacillus coli, and, of course, the xerosis bacillus, or, as it is more happily called, the bacillus communis conjunctivæ (A. Lawson).

Keratomalacia often leads to destruction of the cornea, and if the cause in the shape of some general illness cannot be grappled with, to the death of the patient, usually from broncho-pneumonia.

The facts of my four cases, all of which were seen at the North-Eastern Hospital for Children, London, follow:—

(1) Francis J———, 7 weeks, admitted October 11, 1906, and died October 22, 1906. Patient was the youngest of eight children, of whom four survived; there had been two miscarriages in addition. The infant, who was born at term, remained well until he was five weeks old, when he began to waste, "snuffled," and developed a rash upon the face and buttocks. On admission, a miserable-looking "snuffling" infant, who weighed (nude) $8\frac{1}{2}$ lbs. Extensive copper-coloured rashes and superficial ulcerations on buttocks, thighs, face, and at angles of mouth. The right eye showed merely a slight inflammation of the conjunctiva, such as is not infrequently present in syphilitic babies during the eruptive stage. The left cornea, however, was covered with an ash-grey slough, through the lower part of which a protusion of Descemet's membrane (keratocele) could be recognised. On October 18th, the right cornea was affected; and it was noted as an unusual feature of the case that dry, white patches of xerosis were present upon the conjunctiva of both upper and lower lids. The baby, who had the hoarse and raucous cry characteristic of a syphilitic infant, was extremely ill, although the skin eruptions were fading, and the cutaneous ulcerations healing. On October 19th the right cornea looked as if it had been cauterised with silver nitrate—it was of ashen hue, with an irregular and gibbous surface. The

child died on October 22nd, 1906. Spirochætae were found in scrapings from both the corneæ, taken on several different occasions.

(2) William C———, 9 months, admitted February 7th, 1907, and discharged April 5th, 1907. The left eye was stated to have been bad for one month. The signs of congenital syphilis included frontal bosses, "snuffles," depressed bridge of nose, and a subcutaneous gumma of one thigh. A sloughy and unhealthy looking ulcer of large size, occupied the central parts of the left cornea, but no marked reaction, such as redness or watering of the eye, was present. Weight, 10½ lbs. On February 14th, the notes stated that towards the centre of the lower third of the left cornea was a small ulceration, through which Descemet's membrane protruded when the baby cried. On February 21st the child's general condition was better, and the corneal ulcer was healing. On March 14th the left cornea showed a leucoma, to which the iris was adherent, in its lower third, and a small anterior pyramidal cataract was likewise present. Child discharged on April 5th, then weighing 11¾ lbs. On February 13th, under chloroform, scrapings were taken from the left cornea, and handed over to Dr. W. A. Milligan, pathologist to the Hospital, for examination. Dr. Milligan reported: "There are to be seen delicate screw-like rods resembling the spirochæta pallida." Observation repeated on February 21st. Similar results were obtained independently by myself.

(3) An infant of three months, in whom the syphilitic manifestations included athrepsia, coryza, slight enlargement of the spleen and liver, and a few small ulcerated papules about the anus. The corneæ were practically destroyed and the eyes in a condition of incipient panopthalmitis when the baby was seen by me. The spirochaeta pallida was found in scrapings from the diseased cornea. A microscopical field could seldom be examined without coming across one or more of the micro-organisms.

(4) Joseph W———, aged 3 months, admitted July 11th, 1907, and died July 28th, 1907. *Family history*: Three children born dead—one at seven, one at eight, and one at nine months. The fourth baby, a girl, wasted from the first, and both eyes were affected, probably with ophthalmia neonatorum, on the fourth day. She died at four months. *Personal history*: Born "a fine baby," but has wasted since three weeks old. Subject to vomiting after her bottle for the last three weeks. No diarrhœa. It has been noticed by the mother that the baby's eyes have been inflamed for five days, and that for two days "a white film" has formed over the left eye. *On admission*: The child

was wasted, cried continually, and "snuffled" loudly. Weight, 7½ lbs. Temperature, 97·6° F. Ulcerated condylomata around anus.

The umbilicus showed a dry ulcerated surface overlying a thickened mass, probably a gumma. Spleen and liver palpable. Infant jaundiced. There was a sanious watery discharge from both eyes, especially from the right. Examination under chloroform showed that the corneæ were surrounded by a glistening ring of xerosis, slightly wider at the inner and outer side than elsewhere. Again, the ocular conjunctiva was of characteristic silvery appearance, was dry, wrinkled, and could be readily pinched up. The right cornea was tolerably clear, except for a purulent infiltration in its upper-inner quadrant. A large part of the left cornea was occupied by a purulent focus, made up of two divisions—a larger one below and to the inner side and a smaller one to the outer side at a somewhat higher level. None of the cornea was clear. No swelling of the lids or other evidence of inflammatory reaction. *Progress*: July 18th. Right cornea occupied by a greyish-yellow slough, and a bulging dark spot in the lower-outer quadrant represents a keratocele. The left cornea was in a similar, but even more desperate, condition. Evidences of inflammatory reaction conspicuous by their absence. Navel healed. General condition of child not improved. July 26th. Baby has developed a well-marked papular eruption of a dull-red colour, over the body and limbs. The papules average one-eighth of an inch in diameter. The infant "takes" badly, "snuffles," and is getting weaker. Death from exhaustion on July 28th. No autopsy. On July 12th, Dr. Milligan reported staphylococcus pyogenes albus in a tube of agar-agar smeared with secretion from one cornea. On July 14th, examination of smears for the spirochæta pallida reported negative. On July 25th, however, staphylococcus albus on agar-agar, and spirochætæ found in smears treated by the Giemsa plan.

Remarks.—In four cases of keratomalacia, then, that is to say, in all that were examined, the spirochæta pallida, or an organism morphologically not to be distinguished from it, was demonstrated in smears from the affected corneæ when stained by the Giemsa and the Proca-Vasilescu method. I may say in passing that the latter, in my experience, yields the clearer microscopical pictures. The pathological observations were made independently by Dr. W. A. Milligan and myself, and our findings agreed in each instance. From the diagnostic point of view, the discovery of the spirochæta was useful in case No. 3, where the syphilitic nature of the process was not of an altogether conclusive character. In the other cases, however, the specific nature of the corneal gangrene was placed beyond reasonable

doubt by the associated clinical symptoms, altogether apart from the results of the bacterioscopic examination.

Finally, it should be pointed out that spirochætes have been found in the tissues, as the cornea, iris, and ciliary body, of seemingly unaffected eyes of syphilitic fœtuses and babies by Peters (*Klin. Monatsbl f. Augenheilkunde*, August, 1906), by Gierke and Stock (*Ibidem*), by Bab (*Deutsche med. Wochenschrift*, November 29, 1906), by Schlimpert (*Ibidem*), and, lastly, by myself (THE OPHTHALMOSCOPE, June, 1907). These observations naturally raise the question whether the spirochætes observed by me and described in the present communication would not have been found in the corneæ of the patients apart from the existence of keratomalacia. With regard to this point I am prepared to express no opinion.

CLINICAL MEMORANDA.

HERPES ZOSTER NASALIS.

BY

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CHIEF CLINICAL ASSISTANT, ROYAL LONDON OPHTHALMIC HOSPITAL.

Herpes zoster affecting the area of distribution of the nasal nerve is a rare condition, and the following case presents some interesting features:—

F. D., a boy six years old, on August 29th, 1907, came under my care with a vesicular eruption on the left side of his nose, which presented all the appearances of a herpes zoster. He was not suffering much pain, had not been disturbed in his sleep, and his general condition was excellent.

The eruption was strictly limited to the middle line of the nose, it extended right down to the tip, but the septum and margins of the nasal aperture were not involved. Above it extended up to the level of the eyebrow as far outwards as the inner canthus, and still further up were two or three vesicles in a vertical row close to the middle line. Laterally, the margin of the eruption projected out on to the cheek in the form of a small tongue-shaped process at the level of the lower margin of the nasal bone; there were three rather larger vesicles forming a horizontal row on the skin of the lower lid, and involving about one-fourth of its extent; the upper lid was not affected. The conjunctiva and cornea were quite unaffected, and, so far as

could be told without any special examination, the mucous membrane of the nasal cavity had also escaped. The subsequent course of the case was satisfactory.

Remarks.—In this case we could not have had the usual supply of the cornea from the nasal nerve through its infratrochlear branch, for the infratrochlear was affected, as shown by the spots at the root of the nose, and along the lower lid.

Photo. by Dr. COATS.

The nasal mucous membrane escaping could possibly be accounted for by the internal nasal branches coming off very far back in the orbit and thus being unaffected.

The points of interest were the age, the absence of pain, and the escape of the cornea.

A NOTE UPON THE EFFICACY OF THE SUBCONJUNCTIVAL INJECTION.

BY

H. GREY EDWARDS, M.D.

OPHTHALMIC SURGEON CARNARVONSHIRE AND ANGLESEY INFIRMARY, BANGOR, AND TO THE NORTH WALES HOME TEACHING SOCIETY FOR THE BLIND.

Ever since I saw Dr. Darier, of Paris, demonstrate his method of subconjunctival injection at the Oxford Ophthalmological Congress in July, 1906, I have practised it constantly in suitable cases. The case which I wish to bring to notice is, however, of so remarkable a character that it stands quite alone out of all those treated by me in this manner. The facts follow:

On April 1st, 1907, there was admitted to the Carnarvonshire and Anglesey Infirmary at Bangor a male patient, S. W., aged 21 years, a coal miner from South Wales. He stated that some sixteen days previously, while at work, he received a blow in the right eye from a piece of coal. The right eye became painful, swollen and red, and a discharge commenced, which was at first thin and then thicker and yellow. He had an "eye lotion," but the eye getting worse, he returned to North Wales and was sent to the Carnarvonshire and Anglesey Infirmary.

On admission, the condition of the eye was as follows:—the eyelids were very much swollen, the conjunctiva was œdematous and of a dusky red colour; all that could be seen of the cornea was a yellow washleather-like substance in the heart of the red conjunctiva. The eye, in fact, looked like the bottom of a tomato, while the cornea looked like the yellow part where the stalk joins the fruit. Pus was pouring down the face, but the swelling of the conjunctiva was such that it was not possible to see where the perforation in the cornea was, as it was not in front.

As it was late at night when the case came in, the eye was washed with boric lotion and kept clean, the idea being that the eye must be removed next day.

On the morning of April 2nd the patient was brought to the theatre with a view to having the eye enucleated.

I examined the case carefully, and so hopeless did it look that certainly twelve months before I should not have hesitated, but should have removed the eye at once. However, inlight of my past experience with the method, I decided to try subconjunctival injection.

I used an all-glass syringe with a curved needle and injected 20 minims of a 1 in 5,000 solution of bicyanide of mercury, well beyond the meridian of the eye, at the outer and upper angle of the eyeball, between the insertions of the external rectus and superior oblique muscles, under the influence of a 4 per cent. solution of cocaine.

The eye was ordered to be kept clean with a 1 in 5,000 hydr. perchlor. solution, and a 20 per cent. argyrol solution dropped in three times daily. Evening temperature, 99·40° F.

By the next day there was a marked diminution in the quantity of pus. On April 5th, the subconjunctival injection was repeated. The swelling was going down, and it was clear that the eye was doing well. On April 9th, another injection of 20 minims was given, and the swelling had gone down sufficiently to see that in the upper and outer angle of the cornea there was a perforation, and that a portion of the iris was protruding from the wound. The anterior chamber was full of pus, which was oozing through the perforation of the cornea. On April 14th the injection was repeated. I had considered that the protruding iris should be cut off, but after taking forceps and scissors in my hands, I decided to leave it alone. Here comes the most remarkable thing about the case. The iris was seen day by day to be slipping back into the anterior chamber, and eventually the wound healed, leaving the iris perfectly free in the anterior chamber.

On this date (April 14th) the left eye got infected. The eye was injected and painful. Temp. 100·2° F.

This was, however, checked at once with pads wet with iced zinc chloride solution, gr. ij.-ℨj., and argyrol drops but for the moment it made me very anxious lest I had not risked both eyes in trying to save one.

On the 20th and 24th April injections were again given, the argyrol having been abandoned some days ago in the right eye.

From this date the eye got steadily better, the cornea clearing, although aqueous still leaked a little.

May 9th another subconjunctival injection given.

May 13th conjunctival swelling gone down, sclerotic to be seen clearly.

Patient allowed to go home, boric lotion being given to keep the eye clean.

From this time up to the present (August 10th) injections have been given every fourteen days, with a view of clearing the leucoma which covered a good half of the surface, entirely obscuring the pupil. This is going on very satisfactorily, and the patient is now able to see well enough to tell the time on his watch.

I consider that subconjunctival injection possesses a wonderful power of preventing adhesions of tissue by plastic infiltration, and of rapidly absorbing those formed at a recent date and, more slowly, the chronic ones. The discussion as to how it acts is too long to enter into along with the report of this case.

A CANALICULUS DILATOR FOR THE LOCAL TREATMENT OF STILLICIDIUM.

BY

CHARLES A. OLIVER, A.M., M.D.,

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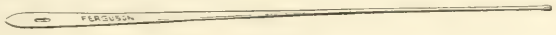
The following full-size cut illustrates a form of canaliculus dilator which has been successfully employed by the writer for several years past in the treatment of small mucous occlusions, which are so frequently seen in cases of slight stillicidium found in association with minor affections of the upper nasal passages; they often being the beginning expressions of one of the coarse types of lacrymal disease which are the results of improper treatment, neglect and infection.



The instrument is made of flexible silver. It is manufactured by Mr. Joseph C. Ferguson of this city.

The dilator should be gently used about once or twice a week for a couple of weeks' time, either immediately after all active conditions in the nose and accessory sinuses have subsided through medical means, or during the latter part of the time of post-operative treatment of the involved passages.

The very earliest signs and symptoms of this form of lacrymal disturbance being thus recognised and treated in this manner, will prevent any later appearance of gross expressions of lacrymal disease from taking place; two or three series of treatments at sufficient intervals, as a rule, effecting a permanent cure.

Of course, all other clinical varieties of lacrymal disease must be submitted to remedial and surgical measures that are the most appropriate for each individual case.

NOVELTIES.

CALOMEL IN CRYSTALLINE FORM.

This new condition of calomel is of considerable interest to the chemist, as calomel has always been looked upon as occurring in the condition of an amorphous powder. The new crystalline form is manufactured by the interaction of mercuric chloride and lithium sulphite.

An ophthalmic surgeon, who has given the substance a trial, considers it a great improvement on the ordinary variety for ophthalmic use, as it is more adherent and is decidedly less irritating than ordinary calomel as a dusting powder for eye treatment. It is interesting to note that the specific gravity of this new calomel is only 4.5 to 5, as against ordinary calomel, 6.5 to 7. This probably explains the reason of the superior adhering quality. The salt, either in the form of powder alone, or mixed with a little sterile boriac acid powder or starch, or an ointment (5 to 10 per cent. strength), should certainly be worth a thorough trial by the ophthalmic surgeon.

It is manufactured by W. Martindale, 10, New Cavendish Street, London, England.

TRANSLATIONS.

THE NEW PROCEDURES FOR THE DIAGNOSIS OF SYPHILIS.

(Technique of examination for spirochætes in smears and sections—Technique of experimental inoculations—Technique of examinations for syphilitic antigènes and antibodies.)

BY

V. MORAX, M.D.*

PARIS, FRANCE.

[*Translation by R. J. Coulter, M.B., F.R.C.S.I.*

(*Concluded.*)

II. Experimental inoculation.

A. Inoculation in human beings—Auto-inoculation.

We shall not waste time on the experimental inoculation with syphilis of any person not already suffering from the disease. This is a diagnostic proceeding which would be in the province of the police.

Until recent years it was admitted that in contradistinction to soft chancre (caused by the bacillus of Ducrey), syphilitic chancre was not inoculable on a patient suffering from the disease, but Dr. Queyrat, of the Cochin Hospital, has shown that a fresh chancre can frequently be caused by inoculation from a recent chancre.

*From the *Annales d'oculistique*, December, 1906, and July, 1907, with additions by Dr. MORAX.

This observer has obtained positive results in 17 out of 20 attempted auto-inoculations made during the eleven days immediately following the appearance of the primary lesion. In such cases a spot appears, after an incubation of twelve or thirteen days, which becomes indurated, and takes on the characters of a hard chancre.

A patient suffering from a hard chancre cannot be successfully inoculated from it later than the eleventh day after its appearance.

Our former opinion, as stated above, must be modified in accordance with these facts.

B. Inoculation in animals.

In spite of some positive results obtained by Klebs, Martineau and Hamonic, and by M. and Ch. Nicolle, it did not seem that inoculation of animals with syphilitic products could ever become a means for the diagnosis of syphilitic infection.

Metchnikoff and Roux, however, experimenting on the anthropoid apes, and in particular on chimpanzees, have shown that in them inoculation is always successful. The chimpanzee is the animal which is most susceptible to inoculation. This can be done on any part of the integument. For preference the region of the eyebrow or the balano-preputial groove is chosen. The surface of the suspected lesion is scraped with a Vidal's scarifier, and a little fluid is collected from it. A series of small superficial incisions is then made with the instrument and covered with the fluid collected from the lesion.

At the end of five or six days there is a little redness, and a tiny crust sometimes forms at the site of the inoculation, but after a week all trace of these, as a rule, has disappeared and the integuments have regained their normal appearance. It is not until much later, from the fifteenth to the twenty-third day after the inoculation, that a zone of congestion appears, which becomes indurated and takes on the characters of an ulcerated papule. This is usually covered with a crust if the lesion is situated on an uncovered integument, but on the balano-preputial groove its surface remains weeping and moist. This inoculated chancre, which heals spontaneously after a few weeks, is accompanied by glandular enlargement which commences almost at the same time as the cutaneous lesion, but later increases markedly, presenting the same indolent characters as are seen in human beings.

During the months following the appearance of the chancre small papular or papulo-squamous lesions are sometimes seen on the surface of the integuments, and the development of a generalised polyadenitis has also been observed.

To sum up, these symptoms resemble to a large extent those which usually occur at the commencement of syphilitic infection in man. I purposely pass over the later accidents which have been observed in exceptional cases in inoculated anthropoids.

Chimpanzees have been infected from a number of human lesions: chancres, syphilides, blood, and even the walls of certain gummata, but the inoculation of the contents of a gumma has never given a positive result.

Syphilis is transmissible from chimpanzee to chimpanzee.

The chimpanzee has been mentioned before the other animals which can be inoculated with syphilis because the study of its reaction to the syphilitic virus demonstrates the inoculability of syphilis upon animals, and it may be added that up to the present no other animal has been found so sensitive to inoculation. Its extremely high price (from 500 to 800 francs apiece), however, greatly diminishes its practical value as a means of establishing a diagnosis. The same may be said of another anthropoid, the orang-outang, in which an inoculation chancre can be easily produced. This, however, does not appear to be usually followed by secondary manifestations.

It has been shown that it is easy to produce an inoculation chancre in the *inferior apes*. The eyebrow the genital organs, or, as suggested by Thibierge and Ravaut, the free edge of the eyelid may be chosen as the site for this. The lesions of syphilis in cercopitheci are rather different from those observed in man or the chimpanzee, and the result of inoculation has not the same distinctness as in the latter. In addition, the results are very inconstant. Thus in seven macaques superficially inoculated by Metchnikoff and Roux with the pulp of a hard chancre, only four developed lesions. The incubation stage lasts from three to five weeks (it has oscillated between a minimum of 15 days and a maximum of 65 days).

Bonnet monkeys are more susceptible, and in them Metchnikoff and Roux have obtained 10 positive results in 20 inoculations. Cynocephali have also proved more susceptible than macaques; and of four inoculated, three were infected but presented slight lesions similar to those of the macaques.

In case of doubt as to the nature of the lesion produced in an inferior ape as the result of an inoculation it is always possible to excise the lesion entirely, or in part, and to treat it as a syphilitic specimen, examining it for spirochætes by the silver method.

Bertarelli has succeeded by means of this method of impregnation with silver in demonstrating a very elegant procedure for diagnosing syphilis, which has since given rise to a number of publications, and which is of considerable interest to

ophthalmologists, as it depends on an ocular inoculation. A fragment of suspected tissue (wall of a chancre, papule, etc.) is excised and, if it comes from a contaminated region, is washed in several vessels of sterile physiological solution. The eye of a rabbit is then cocained and a fragment of the tissue is inserted into the anterior chamber or rubbed over a series of scarifications on the surface of the cornea.

In the first case, one or more fragments of tissue are introduced through a small keratome incision, and pushed well in with a spatula, so that they may be left some distance from the wound, through which they would otherwise have a tendency to escape.

When the inoculation is made by scarification, the lids being held open, a series of fairly deep parallel incisions is made in the cornea. The fragment of tissue is then seized by forceps and rubbed vigorously on the cornea, after which the lids are kept open for a short time to prevent the fluid from being wiped away.

The tissue to be inoculated can also be pounded up, mixed with water, and injected into the anterior chamber.

Whatever method of inoculation is adopted, a slight ocular reaction occurs at times during the first few days. This has no special significance, and probably depends on the introduction of some germs or on the operative traumatism. It disappears in a few days, and the characteristic reaction does not appear until after an interval of from two to six weeks. This consists partly in the appearance of small granulations the size of a pin-head situated at the edge of the iris, and partly in a diffuse opalescence of the cornea which has all the characters of parenchymatous keratitis.

If the experimental keratitis is allowed to run its course, an interstitial vascularisation is soon produced, and later the lesions gradually retrograde until at the end of eight or ten weeks no trace of them remains.

From a diagnostic point of view, it is better, as soon as the lesions of parenchymatous keratitis appear, to remove the eyeball, to fix it in formol and to treat it by the silver impregnation method, when considerable masses of spirochætes will be found on the borders of the infiltration. Without being constant, the positive results obtained by this method are so frequent, that a certain amount of practical interest attaches to them. Thus, Scherber obtained 6 positive results from 8 inoculations of rabbits with chancres, syphilitic glands, papules, or blood from patients with secondary syphilis. Greeff and Clausen have repeated these experiments on rabbits and inferior apes.

In more recent work, Bertarelli has succeeded in passing the virus from rabbit to rabbit with 100 per cent. of positive results. The lesions usually become more severe and more extensive in

transmission, and the spirochætes are always found in very great numbers. Bertarelli has been able to infect the cornea of the macacus cynomolgus, the guinea-pig, the dog, and the sheep.

Study of the special properties of the tissues and fluids of syphilitics.

The methods of diagnosis, based upon a study of the special properties of the tissues or fluids of syphilitics, are much more complex than those which we have just considered. Their application requires a *technique* which is difficult to acquire, and it must be recognised that the results obtained up to the present are of theoretical rather than of practical value. Nevertheless, the interest of these questions leads us to give a brief description of them.

When a microbe develops in a human or animal organism it undergoes a peculiar modification giving rise to a substance which we designate by the name of "antigène."* The syphilitic "antigène" is a body which has certain properties of the spirochæta pallida and is produced only by that micro-organism. The demonstration of its presence can, therefore, serve to prove the proliferation of the spirochæte in a fluid or tissue, and indicates a state of infection.

On the other hand, the proliferation of a microbe, in the present case, that of the spirochæta pallida, causes after a time the appearance in the blood of a new substance which can be considered as a syphilitic antibody. The presence of this substance appears to correspond with a state of relative immunisation of the organism. If it is possible by any means to discover the presence of this antibody, the syphilitic infection of the organism can be inferred from it.

Examination for the syphilitic "antigène" or antibody cannot be made by direct methods. The procedure by which their presence can be diagnosed is based upon a peculiar property which they possess of combining with each other and fixing a substance normally contained in all fresh serum to which the following names have been given:—alexine (Bordet), cytase (Metchnikoff), and complement (Ehrlich). The reaction by which the presence of this combination is proved has been described by Bordet and Gengou and is known by the name of the "Bordet-Gengou reaction" or the deviation of the complement (*complementablenkung*). In it hæmolysis plays the part of an indicator, and we must therefore first describe what is meant by hæmolysis or the hæmolytic reaction.

*The term "antigène" is really applied to every substance (animal cell, micro-organism, etc.) capable of producing an antibody by its introduction into an animal organism.

On three separate occasions at intervals of a week, 10 to 20 cc. of defibrinated sheep's blood are injected under the skin of a rabbit. A week after the last injection the rabbit is bled and its serum collected. This serum mixed with an emulsion of the red corpuscles of a sheep has acquired the property of rapidly dissolving the corpuscles and transforming the turbid emulsion into a transparent coloured fluid. It is a hæmolytic serum and contains in reality two different substances, one of which (the sensitisor or amboceptor) is stable, resists a temperature of 56° C., and holds the same relation to the red corpuscle which the syphilitic antibody holds to the spirochæte, while the other (the alexine, cytase, or complement), is unstable and is destroyed by heating to 56°C. for 15 minutes.

If the hæmolytic serum is heated to 56°C. for 15 minutes it is rendered inactive, because the alexine necessary for its solvent action is wanting, and is known as inactive hæmolytic serum. If a small quantity of alexine is added to the mixture of sheep's red corpuscles and inactive hæmolytic serum, hæmolysis takes place. We have seen, on the other hand, that a combination of the syphilitic "antigène" and antibody is capable of absorbing alexine. If to a mixture of "antigène" and antibody there is added just enough alexine to be fixed by the combination, and then further additions are made of inactive hæmolitic serum and red corpuscles, hæmolysis will not take place, since all the alexine will have been fixed. This reaction can be represented in the following manner:—

A	B	C	D	E
Syphilitic "antigène"	Syphilitic antibody	Alexine (complement)	Sensitisor	Red Corpuscles

If A + B fixes C, D + E does not find any C free, and the chain C + D + E cannot be formed, this is shown objectively by the absence of hæmolysis. As it is possible to prepare A and B artificially, it is obvious that by means of this reaction we can discover the presence of either of these bodies in the serum.

Preparation of A (syphilitic "antigène"). As we are not yet able to cultivate the spirochæta, its "antigène" can only be obtained indirectly. Recourse is had to tissues where the presence of spirochætes in large numbers has been established, such as chancres, papules, or the viscera of heredito-syphilitic children. These are collected as aseptically as possible and divided into small pieces, which are macerated in the following solution:—

Water	1,000 grm.
NaCl	8·5 grm.
Carbolic acid	5 grm.

One part of tissue is put in four parts of normal saline solution and the whole is placed for 24 hours in a shaking

apparatus, at the end of which time it is decanted and centrifuged, when the clear fluid contains the syphilitic "antigène."

Marie and Levaditi use heredito-syphilitic liver; they collect it as soon as possible, dry it in a vacuum after having pounded it, and keep it in an ice-house. This powder retains its antigènic properties for a long time. To use it, 1 grm. of the powder is emulsionised in 30 c.c. of normal saline solution and left for 24 hours, at the end of which time the fluid is separated from the deposit by centrifuging. The clear fluid contains the "antigène."

Preparation of B (syphilitic antibody).—A serum rich in syphilitic antibodies is obtained by injecting an ape on several occasions with syphilitic organs containing numerous spirochætes, such as syphilitic placentæ or the liver of heredito-syphilitics. After several injections at intervals the animal is bled, and its serum is collected and rendered inactive by heating to 56°C. for 15 minutes, when it contains only B (syphilitic antibodies), capable of fixing A, and forming with C a close chain.

Preparation of C (alexine or complement).—Every fresh serum can yield alexine. In practice the fresh serum of guinea pigs is used. This is diluted with equal parts of saline solution (8 per 1,000) and used within 24 or 48 hours.

Preparation of D and E.—The method of obtaining D (inactive hæmolytic serum) has already been given. To prepare E (emulsion of red corpuscles), a quantity of sheep's blood is shaken up with some glass balls in a sterile vessel, and 5 c.c. of this defibrinated blood is mixed with 100 c.c. of saline solution (8 per 1,000).

We shall now describe briefly how the reaction is carried out with these materials.

Technique of the Bordet-Gengou Reaction.

Small test tubes (10 c.m. long by 1 c.m. in diameter), are generally used. These are numbered and placed on a stand. Care is taken to equalize the quantity of fluid (as a rule, 3 c.c.) used in each reaction by adding to the contents of each test tube sufficient saline solution (8 in 1,000) to bring them up to the required volume. The fluids are measured by means of accurately calibrated pipettes graduated to $\frac{1}{100}$ c.c.

To examine whether A (syphilitic antigène) exists in a suspected specimen (gumma, a diseased gland, etc.), the latter, as has been described above, is divided into small pieces, which, after being macerated in four times their own volume of saline solution, are centrifuged. The resulting clear fluid is designated A ? and 0·1 c.c. of it is placed in one test tube, 0·2 in another, and so on up to 1 c.c.

Quantities of B (serum of an ape which has been treated with products rich in spirochætes, rendered inactive by heating to 56° C.) varying from 0·05 to 1 c.c. are added, followed by 0·1 c.c. of C (alexine, cytase, or complement), *i.e.*, serum of a normal guinea pig diluted with an equal quantity of saline solution (8 per 1000). Sufficient saline solution is added to these mixtures of A, B, and C to bring the quantity of each up to 1·9 c.c. (The subsequent addition of 1·1 c.c. of D and E brings the total quantity of fluid in each test tube up to 3 c.c.).

The mixture of A ? B and C + saline solution is then placed in an incubator at 37° C. for two hours to aid the combination of its three components, after which 0·1 c.c. of D (the inactive hæmolytic serum of a rabbit) and 1 c.c. of E (mixture of defibrinated sheep's blood and saline solution) are added to each test-tube. The tubes are replaced in the incubator and examined after thirty minutes, when the transparence (or otherwise) of the liquid will show whether hæmolysis (dissolution of the corpuscles) has taken place or not. It goes without saying that in each hæmolytic experiment control-tubes must be made in which A ? B, or C, or A ? and B, B and C, or A and C are omitted.

If an examination is made for the presence of the syphilitic "antigène" in the blood, the serum of the blood should not be used, but an extract of the blood in saline solution must be made as in the case of tissues (walls of chancres, gummata, etc.), by bringing equal parts of the blood and of saline solution into contact with each other.

The following table will explain the plan of an experiment even better than the above description :

No. of tube.	A Maceration of suspected gland in saline solution.	B Serum of ape treated by injection with syphilitic products and rendered inactive.	C Fresh serum of guinea pig half strength.	Saline Solution.	D Hæmolytic serum of rabbit rendered inactive.	E Defibrinated sheep's blood 5 per cent. in saline solution.	Results.
1	- -	-	0·1	1·8	0·1	1 c.c.	Hæmolysis
2	1 c.c.	- -	0·1	0·8	0·1	1 c.c.	,,
3	1 c.c.	0·025	0·1	0·78	0·1	1 c.c.	No ,,
4	1 c.c.	0·05	0·1	0·75	0·1	1 c.c.	,, ,,
5	1 c.c.	0·1	0·1	0·7	0·1	1 c.c.	,, ,,
6	1 c.c.	0·5	0·1	0·3	0·1	1 c.c.	,, ,,

Tube No. 1 shows that the hæmolytic reaction takes place normally.

Tube No. 2 shows that the extract of the organ by itself has not the power of fixing the alexine (C).

Tubes Nos. 3—6 show that A?+B have fixed C, thus preventing the hæmolytic action from taking place.

The conclusion that the syphilitic antigène really exists in the suspected specimen is therefore justified.

If hæmolysis had taken place in tubes 3—6 the contrary conclusion, that the extract A? did not contain syphilitic "antigène" would have been justified.

When the object of the experiment is to discover the presence of the syphilitic antibody (B) in the serum of a syphilitic the procedure is similar. A is supplied by an extract of hereditosyphilitic organs. B? will be the serum of the suspected patient rendered inactive by heating to 56° for 15 minutes in a water bath.

Results obtained by the application of the Bordet-Gengou method in the diagnosis of syphilis.

The Bordet-Gengou method has been applied to the diagnosis of syphilis by Wasserman and Plaut, and by Neisser, Bruck, and Schucht, and a certain number of researches based on it have been made more recently by Marie and Levaditi, by Schütze, and by Morgenroth and Stertz, etc.

To judge by reading descriptions of the different stages of the reaction, this diagnostic method is rather complicated, and in carrying it out a certain amount of enthusiasm and much precision are necessary. This, however, would not be an obstacle to its application if the results obtained by it were really valuable.

At present it is difficult to estimate its value, as it is only by comparing a large number of results that a fair conclusion can be formed. It is, however, already evident from the observations which have been made that it can only be relative, as the serum of undoubted syphilitics may contain neither antibody nor "antigène." Thus, in 163 cases of human syphilis investigated by Neisser, Bruck, and Schucht, the presence of syphilitic "antigène" or antibody was established 114 times, *i.e.*, in only 70 per cent. of the cases examined.

The following are the results of Neisser, Bruck, and Schucht as to the diagnosis of syphilitic infection by "antigène":—

Congenital syphilis	29	cases	examined	...	29	results	+
Placentæ of these patients ...	17	,,	,,	...	13	,,	+ and 4 −
Chancres	5	,,	,,	...	5	,,	+
Papules	9	,,	,,	...	8	,,	+
Primary glandular infection...	6	,,	,,	...	6	,,	+
Tertiary lesions	5	,,	,,	...	5	,,	+
General paralysis (brain) ...	7	,,	,,	...	7	,,	+

While normal human tissues never give positive results, tissues infected by the spirochætes regularly give a positive "antigène" reaction. It seems, therefore, that this may be considered a reaction of infection.

Practically its value may prove to be greatest in cases of gummatous lesions or of suspicious glandular enlargement. According to the indications of Neisser, Bruck, and Schucht, it does not seem as if the examination of extract of blood for "antigene" can ever serve as a method for the general diagnosis of syphilis.

The serum and cerebro-spinal fluid have been examined for syphilitic antibodies. Wasserman, Neisser, and Bruck found syphilitic antibodies in the serum of 45 out of 257 syphilitics.

The much-discussed question as to the relation of syphilis to tabes and general paralysis has been investigated by this reaction. Wasserman and Bruck have found syphilitic antibodies in the cerebro-spinal fluid of 36 out of 41 patients suffering from general paralysis. Neisser, Bruck, and Schucht found antibodies in four patients with general paralysis and two with tabes. More recently, Schucht obtained a positive reaction in eight out of 12 patients with tabes. Morgenroth and Stertz found syphilitic antibodies in the cerebro-spinal fluid of eight general paralytics. Marie and Levaditi examined 39 general paralytics, 29 of whom (73 per cent.) had antibodies present in the cerebro-spinal fluid. The antibody reaction on the cerebro-spinal fluid was also positive in five tabetics out of nine, and it was absent in 17 control cases (melancholics, idiots, epileptics, alcoholics, etc.).

Bibliography.

ARNING. — Staining of the spirochæte pallida. *Deutsche med. Woch.*, 1907, p. 1027.

AUBINEAU. — Chancre of the conjunctiva. *Annales d'Oculistique*, T. 138, p. 13.

BAB. — Presence of spirochætæ in the human eye. *Deutsche med. Woch.*, 1906, p. 1945.

BABES and PANEA. — On the pathological lesions and spirochæta pallida in congenital syphilis. *Berl. klin. Woch.*, 1905, No. 28.

BANDI and SIMONELLI. — On the presence of the spirochæta pallida in the blood and the secondary manifestations of syphilitics. *Centralbl. f. Bakt.*, Bd. XI, f. 1, p. 64.

BERTARELLI, VOLPINO, and BOVERO. — Researches upon the spirochæta pallida Schaudinn in syphilis. *Centralbl. f. Bakt. Origin.*, Bd. XL, 1905, p. 56, 64.

E. BERTARELLI. — On the transmission of syphilis to the rabbit. *Centralbl. f. Bakt. Orig.* Bd. XII, 1906, p. 320.

E. BERTARELLI. — On the transmission of syphilis to the rabbit (2nd note). *Riv. d'Ig. San. publ.*, 1906, T. XVII.

E. BERTARELLI. — The syphilitic virus of the cornea of the rabbit and the receptivity of the lower apes and of guinea-pigs towards the virus. *Riv. d'Ig. et San. publ.*, 1907, T. XVIII.

BODIN. — Spirochæta pallida in hereditary syphilis. *Ann. de Dermat. et Syphil.*, 1905, No. 7.

BORREL and BURNET. — The rapid diagnosis of syphilitic lesions. *C. R. Soc. Biologie*, T. LX, 1906, p. 212.
BURNET and VINCENT. — The localisation of the spirochæta pallida Schaudinn in sections of syphilitic chancre. *C. R. Soc. Biologie*, T. LIX, nov., 1905, p. 474.
BUSCHKE and FISCHER. — On the presence of spirochætæ in the viscera of a syphilitic infant. *Deut. med. Woch.*, 1905, Nos. 20 and 21.
CHAILLOUS. — Chancre of the bulbar conjunctiva. *Soc d'Opht. de Paris*, juillet, 1907.
DOUTRELEPONT and GROUWEN. — On the presence of the spirochæta pallida in tertiary syphilitic products. *Deutsche med. Wochens.*, 1906, p. 208.
FLUGEL. — A new proof of spirochætæ in syphilis. *Deut. med. Woch.*, 1905, p. 1775.
GIEMSA. — Remarks upon the staining of the spirochæta pallida. *Deut. med. Woch.*, 1905, No. 28.
— See also *Centralblatt f. Bakt.*, XXXVII, p. 308.
GIEMSA. — Contribution to the study of the coloration of the spirochæta pallida in cover-glass preparations. *Deutsche med. Woch.*, 1907, p. 676.
GREEFF and CLAUSEN. — The spirochæte pallida in interstitial keratitis of experimental origin. *Deutsche med. Woch.*, 1906, p. 1454.
HERXHEIMER. — *Münch. med. Woch.*, 1905, No. 59.
HERXHEIMER and HUEBNER.—On the means of demonstrating the spirochæta pallida in syphilis. *Deut. med. Woch.*, 1905, No. 26.
E. HOFFMANN. — Spirochæta pallida in a macaque inoculated with blood. *Berl. klin. Woch.*, 1905, p. 1450.
E. HOFFMANN. — The etiology of syphilis (Rapport au *Congrès de Berne*). Springer édit. Berlin, 1906.
HOFFMANN and HALLE. — On a better means of staining the spirochæta pallida in smears. *Münch. med. Woch.*, 1906, p. 1516.
KOWALEWSKI. — Chancre of the eyelid with presence of spirochætæ. *Deut. med. Woch.*, 1905, p. 2099.
C. LEVADITI. — On staining of the spirochæta pallida Schaudinn in sections. *C. R. Soc. Biologie*, T. LIX, 1905, p. 326.
— The pathological histology of hereditary syphilis in its relations with the spirochæta pallida Schaudinn. *Ibid.*, T. LIX, p. 342.
LEVADITI and MANOUÉLIAN. — A new and rapid method of staining the spirochæta in sections. *C. R. Soc. Biol.*, T. LX, p. 134.
— Pathological histology and symptoms of primary and secondary syphilis in man; syphilitic chancre of the monkey in its connection with the spirochæta pallida. *C. R. Soc. Biol.*, T. LIX, p. 257.
LOEFFLER. — A new and rapid method of staining micro-organisms, especially the parasites of blood, spirochætæ, gonococci, etc. *Deut. med. Woch.*, 1907, p. 169.
A. MARIE and LEVADITI. — Syphilitic anti-bodies in the spinal fluid of general paralytics and tabetics. *Annales de l'Institut Pasteur*, 1907, p. 138.
F. MARINO. — The staining of protozoa. *Annales de l'Institut Pasteur*, 1904, p. 761.
METCHNIKOFF and ROUX. — Experimental studies on syphilis.
1st Mémoire. *Annales de l'Institut Pasteur*, 1903, p. 809.
2nd ,, ,, ,, 1904, p. 1.
3rd ,, ,, ,, ,, p. 657.
4th ,, ,, ,, 1905, p. 673.
J. MORGENROTH and STERTZ.—The finding of syphilitic anti-bodies in the cerebro-spinal fluid from general paralytics, etc. *Virchow's Archiv*, 1907, Bd. 188, p. 166.
MUHLENS. — A contribution to the experimental syphilitic keratitis of the rabbit. *Deutsche med. Woch.*, 1907, p. 1207.
MULLER and OPPENHEIM. — *Wiener klin. Woch.*, 1906, p. 894.
NATTAN-LARRER and A. BERGERON. — Presence of the spirochæta pallida in the blood of syphilitics. *Presse médicale*, 1906, p. 19.
NEISSER and SACHS. — *Berl. klin. Woch.*, 1906, No. 3.
A. NEISSER, BRUCK, and SCHUCHT. — Diagnostic researches into the tissues and the blood in syphilis. *Deutsche med. Woch.*, 1906, 1937.
NEISSER, BAERMANN, and HALBERSTAEDTER. — Transmission of syphilis to monkeys. *Deut. med. Woch.*, 1906, p. 1, 49, 97.

NŒGGERATH and STAEHELIN. — On the finding of the spirochæta pallida in the blood of syphilitics. *Münch. med. Woch.*, 1905, No. 31.

OPPENHEIMER and SACHS. — A simple and rapid method of demonstrating spirochæta pallida. *Deut. med. Woch.*, 1905, No 2.

PREISS. — The bacteriological diagnosis of syphilis. *Wiener med. Presse*, 1906, No. 49.

PROCA and VASILESCU. — On a method of staining the spirochæta pallida rapidly. *Soc. de Biol.*, 1905, No. 23.

L. QUEVRAT. — Seventeenth case of positive auto-inoculation of syphilitic chancre. *Bull. et Mém. de la Soc. méd. des hôpitaux*, 1907, p. 207.

SCHAUDINN and HOFFMANN. — On the spirochæta pallida in syphilis. *Berl. klin. Woch.*, 1905, No. 22.

— Preliminary communication on the presence of spirochætes in syphilitic products and papillomata. *Arbeiten aus d. Kais. Gesundheitsamts*, Bd. XXII. f. 2.

— On the finding of spirochætes in the lymphatic glands of syphilitics. *Deut. med. Woch.*, 1905.

G. SCHERBER. — Parenchymatous keratitis produced in the rabbit by the inoculation of syphilitic material. *Wien. med. Woch.*, 1906, No 24, p. 726.

SCHERESCHWSKY.—The staining of the spirochæta pallida in smears. *Deutsche med. Woch.*, 1907, p. 462.

SCHLIMPERT.—Anatomico-pathological findings in the eye in two cases of congenital syphilis. *Deutsche med. Woch.*, 1906, p. 1942.

A. SCHUTZE.—An experimental contribution to the serum-diagnosis of syphilis. *Berl. klin. Woch.*, 1907, p. 126.

SIEGEL. — *Abhandlungen der Kgl. Preuss. Akademie der Wissenchaften*. 1905.

SYDNEY STEPHENSON.—The present position of the spirochæta pallida in relation to syphilitic affections of the eye. *The Ophthalmoscope*, June 1, 1907, p. 303.

— Two cases of infantile syphilitic keratomalacia in which an organism resembling the spirochæta pallida was found. *The Ophthalmoscope*, March 1, 1907, p. 142.

STOCK. — Schaudinn's spirochæta in the cornea. *Soc. d'opht. allem. d'Heidelberg*, 1906.

THIBIERGE and RAVAUT. — The inoculation of syphilitic products into the free border of the eyelid in macaques. *Annales de dermat. et syphilig.*, 1905, p. 575.

TOMACZEWSKI. — Transmission in series of experimental syphilis of the rabbit. *Meinchener med. Woch.*, 1907, No. 21.

VEILLON et GIRARD. — The spirochæta pallida Schaudinn in syphilitic roseola. *C. R. Soc. Biologie*, T. LIX, 1905, p. 652.

WASSERMANN and BRUCK. — *Deutsche med. Woch.*, 1906, p. 450.

WASSERMANN, A. NEISSER, BRUCK, and SCHUCHT. — A new contribution to the study of the specific elements of syphilis, etc. *Zeitschrift. f. Hyg.*, 1906, p. 451.

WASSERMANN, NEISSER, and BRUCK. — *Deutsche med. Woch.*, 1906, p. 745.

WASSERMANN and PLAUT. — *Deutsche med. Woch.*, 1906, p. 1769.

INJURIES TO THE EYES OF THE CHILD DURING LABOUR.*

(*Continued.*)

BY

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AUTHOR.	REFERENCE.	CONDITION OF CHILD.	DETAILS OF LABOUR.
Nagel	"Erfahrungen ueber die Anwendung der Achsenzugzange." *Archiv f. Gyn.*, Bd. XXXIX, 1891.	Impression on L. frontal bone. Subconj. blood effusion in L. bulbus oculi. L. sided facial paralysis.	40 years. Multip. 3. Spines 27. Crests 30. Conj. ext. 18·5. 1st vertex. Promontory reachable. Head about ⅛ circumference in brim. Sagittal suture in R. obl. diameter. Small fontanelle L. front. Occiput descended. Axis-traction forceps. The R. blade lay with its fenestration over the R. frontal bone up to two fingers' breadth from the orbit. The L. blade lay over the L. ear up to the throat.
Nagel	"Weitere Beobactungen ueber die Anwendung der Achsenzugzange." *Archiv f. Gyn.*, Bd. XXXIX, 1891.	At the border of the L. lower eyelid a skin wound ½ cm. long. Deep marks from the R. forceps blade.	35 years. Multip. 6. Spines 23. Crests 26. Conj. ext. 17 cms. 1st vertex position. Promontory reachable. About ¼ circumference of head through the brim. Large fontanelle R. front. Sagittal suture in L. obl. diameter, approaching the transverse. Occiput a little descended. Axis-traction forceps. R. blade lay over L. frontal bone, its point on the L. eye. L. blade over the occiput as far as the neck.

* *Beiträge zur Augenheilkunde.* Festschrift Julius Hirschberg. Leipzig, 1905.

Author.	Reference.	Condition of Child.	Details of Labour.
Nagel	*Ibid.*	Subconj. blood effusion in R. eyeball, and in R. lower lid. Large infiltrations in the area of the forceps marks.	29 years. Multipl. 7. Spines 24. Crests 26. Conj. ext. 17. Conj. diag. $9\frac{1}{2}$–11 cms. II vertex position. Promontory reachable. About $\frac{1}{3}$ of the circumference of the head in the pelvis. Small fontanelle R. behind. Sag. suture in R. obl. diameter. Occiput descended.
Sidler-Huguenin	*Loc. cit.*	Paresis of L. facial. R. eye very swollen. After 3 days, both sides, infiltration of conj. bulbi, R. more than L. The R. cornea diffusely clouded *in toto* and finely stippled. R. ant. chamber much deeper than L. and over the whole R. iris fluid blood.	Violent eclampsia. Difficult forceps. The head was still high up and not quite in proper position for forceps application. At the beginning the forceps lay over the R. E. and the L. ear, afterwards they were applied to the sides of the head.
Sidler-Huguenin	*Loc. cit.*	Diffuse cloudiness of both corneæ. Infiltration of the right upper lid.	Generally contracted pelvis. Conj. vera 7·5 cms. Induction. Head in pelvic brim, almost in the pelvic cavity. Sag. suture transverse, both fontanelles about same height, the small one to the R. Forceps without great use of force. Forceps so placed that the R. blade came to lie in the region of the R, sacro-iliac joint, *i.e.*, on the region of the R. mast. process of the child, while the L. at first moved forwards, *i.e.*, grasped the L. frontal bone. During the operation, the small fontanelle turned spontaneously to the front, and the forceps grasped the skull at exit in the transverse diameter. According to the obstetrician, the forceps did not directly press on the eyes.

Author.	Reference.	Condition of Child.	Details of Labour.
Zacke	"Beitrag zum Kapitel der Verletzungen des Kindes unter der Geburt." *Inaug. Dissert*, Berlin, 1889.	Under the periosteum on the roof of the R. orbit a flat extravasation of blood, the size of a penny, beneath which is seen a transversely running fracture of orbital roof.	High forceps.
Petit and Auharet	*Rev. mens. de gyn., d'obstétr. et de péd.* mars, 1900. Quoted from Frommel's *Jahresbericht über die Fortschritte auf dem Gebiete der Geburtshilfe und Gynäk.*, 1900.	Fracture of the lacrymal bone and orbital abscess.	Forceps were applied at first unsuccessfully, and a second time after symphysiotomy; they had lain obliquely over the forehead and mastoid region.
B. Wolff	Case 2 in text.	Fracture of both orbital roofs.	Rickety, flat pelvis. Conj. diam. 9½ to 9 cms. 1st vertex position. A small segment of head in pelvic brim. Sagittal suture transverse. Difficult forceps.
Truc	"Lésions obstétricales de l'œil et de ses annexes." — *Annales d oculistique*. Tome CXIX, 1898.	Fracture of the L. parietal bone. Manifold contusions on the face, and in the orbital region, with transverse tear over the eyebrows. The corresponding upper lid œdematous and ecchymotic. Conjunctiva markedly swollen. Eye appears to lie deeper than the other.	Forceps in pelvic brim, at first in occipito-frontal, then in biparietal diameter.
Kassaboff	Paris, 1898. Quoted from Servel (Case VIII).	Blade-shaped impression on L. frontal bone. R-sided facial paralysis. L. eye closed, R. stands open.	Narrow pelvis. High forceps.

(b) Forceps, without further details as to whether the head was in the pelvic brim, or already deeper.

Author.	Reference.	Condition of Child.	Details of Labour.
Maygrier	"Lecons de clinique obstétricale," 1893, p. 53. Quoted from Truc.	One eye closed. Lids as though pressed into the orbit. On opening the lids, one saw that the eye had been torn away; "il fut d'ailleurs retrouvé par terre dans les langes." Section shewed fracture of orbital roof. A piece of bone had cut through all the attachments of the eye like a guillotine.	Narrow pelvis. Forceps delivery, in the course of which two people had pulled together on the head.
Shukowski	"Ein Fall von schwerer Kopfverletzung des Kindes bei der Geburt." *Djetsk Med.*, No. 2., 1902. Quoted from Frommel's *Jahresbericht*, 1902.	Total protrusion of R. globe out of the orbit section; Fissures R. frontal bone, crossing the coronal suture and the suture between os parietal and os temporal. Fissure of orbital roof. R. jaw articulation ruptured.	42 years. Multip. 6. Normal pelvis. Forceps. The reporter (Stumpf) remarks in Frommel's Jahresbericht, that the forceps had obviously lain diagonally, one blade over the R. frontal bone; and were closed forcibly.
Coccius	"Programme einer Gedenkfeier für Gottlob Bose." Leipzig. 1870. Quoted from Bloch.	Prolapsus oculi. Fracture of orbital roof No external trace of forceps marks.	Forceps delivery.
Sidler-Huguenin	*Loc. cit.*	49 years. Female. Squints with L. eye. Reports that the L. eye had been blind from birth. After birth, the L. eye was quite outside and in front of the orbit. L. optic disc completely atrophic. In the papillo-macular region a connective tissue with strands, which might well be taken as an exudate.	Said to be the result of forceps delivery.

Author.	Reference.	Condition of Child.	Details of Labour.
Steinheim	"Prolapsus bulbi." *Centralbl. f. Augenheilk.*, 1879.	Deep impression on L. frontal bone. L. eyeball hung entirely out of the orbit. Corneal opacity. After reposition, at first favourable course, then panophthalmitis and phthisis bulbi.	Caused through forceps delivery.
Beaumont	*Transact. of the Ophthalmological Society.* Vol. XXIII, 1903.	Eye pushed forward. Reposition under narcotic. Transient cloudiness of cornea.	Forceps delivery. The forceps blade had acted in a similar way to a speculum with which, in the operation of enucleation, the eye is dislocated.
Reese	"A case of traumatic paralysis of the cervical sympathetic with oculo-papillary symptoms, following forceps delivery." Vol. XVI, *New York Eye and Ear Infirmary Reports*, Jan., 1896. Quoted from Schmidt-Rimpler.	Marked deformation of skull. Miosis. Narrowing of the lid cleft, exophthalmos.	Forceps delivery. Reese considers that a lesion of the cervical ganglion of the sympathetic had occurred. Schmidt-Rimpler thinks it more likely that a direct trauma had acted on the globe.
Bouchut	"Traité des maladies des nouveaunés." 1862, p. 815. Quoted from Bloch.	Fracture of the frontal bone, with complete exophthalmos.	A result of forceps pressure.

(To be continued.)

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—THE CRYSTALLINE LENS.

(1) **Hess, C.—Ultraviolet rays and their effect upon the lens. (Versuche über die Einwirkung ultravioletten Lichtes auf die Linse.)** *Arch. f. Augenheilk.*, Mai, 1907.

(2) **Gross, Oscar.—Notes on the chemistry of the lens. Part II. and III. (Beiträge zur Linsenchemie.)** *Arch. f. Augenheilk.*, Juli, 1907, p. 40.

(3) **Seggel.—A case of partial spontaneous absorption of the lens. (Ein Fall theilweiser, spontaner Resorption der Linse.)** *Arch. f. Augenheilk.*, Juli, 1907, p. 47, Illust.

(4) **Salzer, Fritz.—Anatomical examinations of cataracts of fishes caused by worms. (Anatomische Untersuchungen über den Wurmstaar der Fische.)** *Arch. f. Augenheilk.*, Juli, 1907, p. 19. Illust.

(1) **Hess** tried the effect of the uviol lamp upon the lens. He found degenerative changes in the epithelium of the lens capsule, with proliferation of the cells near the equator. These changes were observed in frogs, rabbits, guinea pigs, and monkeys. While the degenerative processes did not set in more rapidly in the warm-blooded animals than in the cold-blooded ones, in the former they seemed to be followed by a much more active proliferation of the cells. The author discusses the bearings which these observations have upon the ætiology of glassblowers' cataract. He thinks it possible that the long exposure of the eyes of these men to rays of short wave-length leads to degeneration and proliferation of the cells of the lens capsule; that ultimately the degenerative changes are not able to keep pace with the degenerative processes, and so cataract formation begins. He observed that the changes described above did not appear when an ordinary sheet of glass was placed between the animal and the lamp, and so he suggests that glassblowers' cataract might be prevented by suitable spectacles. PERCIVAL J. HAY.

(2) A report of an analysis of the fluid which can be expressed from a lens forms the concluding portions of the paper by **Gross**. By subjecting lenses to very high pressure, a fluid is obtained which at first appears clear, but soon becomes cloudy owing to a flocculent precipitate. At the same time the reaction of the fluid changes from alkaline to acid. The precipitate, which is soluble in alkaline, but not in acid solutions, is probably a nucleo-proteid. PERCIVAL J. HAY.

(3) **Seggel's** patient, a man, *ætat.* 50, first came under observation in the spring of 1889. He complained of diminishing vision. On examination, small punctate opacities were found in the anterior capsule of the lens of the left eye. The fundus of both eyes presented a picture closely resembling retinitis pigmentosa. The visual fields were concentrically contracted. R.V.=$\frac{1}{3}$, L.V. $\frac{1}{4}$. In the autumn of the same year broad striae were observed in

the left lens. L.V. = fingers at 3 m. The patient was seen again in June, 1892. At that time the striae had become narrow. L.V. = fingers at 1 m. In March, 1893, the lens had a milky-white appearance. In March, 1896, the cataract was smaller; iridodonesis was present. In December, 1898, the lens had become displaced downwards. In 1901 the displacement had become greater, and in 1906 it was such as to leave the pupil quite free. The author feels convinced that the case was not merely one of dislocation of the lens, but that progressive diminution in size of the lens took place at the same time. PERCIVAL J. HAY.

(4) Though various observers among them v. Nordmann, v. Ammon, and Kuhnt, have reported observations concerning cataracts produced by the larvæ of worms, **Salzer** appears to be the first to have made any anatomical studies of the changes produced in the lens. His investigations were made upon the trout. Macroscopically, he found that the formation of cataract begins without any coarse changes in the other parts of the eye. The opaque lens becomes gradually smaller, and may become dislocated into the anterior chamber, or may be absorbed altogether. In many cases, however, the lens escapes through the cornea, a process which is accompanied by inflammatory changes. The microscopic examination of fourteen eyes revealed fresh parasites in only one instance; in all the others the larvæ had been dead for some time, or only the traces of them were to be seen, or only the last stages in the degeneration of the lens. The parasite lives in the cortex and leaves the nucleus almost untouched. The cortex and capsule are destroyed and undergo absorption, leaving the nucleus which may remain inert or may be expelled through the cornea. In the cure of the condition or the destruction of the parasite, the epithelium of the lens plays a great part. It envelops the parasite and forms a capsule. It either surrounds the living worm and kills it, or possibly it only encapsules the dead parasite. Salzer is not prepared to give an opinion as to what actually does take place. All parasitic worms set up inflammatory changes, and so we find them also in the cases examined by the author. So long as the capsule remains intact, the evidences of inflammation in the neighbourhood are but slight, when, however, the capsule gives way and the lens masses bearing the toxic substances come in contact with the iris, severe inflammatory reaction occurs with profuse emigration of cells, exudation, infiltration, and perforation of the cornea or absorption of the contents of the capsule. Special attention is drawn to certain peculiar clefts and ruptures produced in the lens by the parasite. They are so characteristic as to be in themselves sufficient for diagnosis. In the cortex

they run in any direction, whereas in the nucleus they are arranged radially—owing to the radial arrangement of the cells, as shown by Rabe. The life of the parasites is a short one, so that they are almost found only in the early stages of the disease, and are rare in ripe cataracts. PERCIVAL J. HAY.

II.—DETACHMENT OF THE RETINA.

Ramsay, A. Maitland.—On the treatment of detachment of the retina. *Transactions Ophthalmological Society U.K.*, 1906.

It is refreshing, after reading the panegyrics of certain Continental writers on methods of treatment which seem always to be successful, to turn to **Ramsay's** judicially-written article on the management of retinal detachment. The author has simply taken all his cases of the condition occurring in hospital practice over a period of four years, and reported on the results of treatment by subconjunctival saline injections. The exact nature of the saline varied in different cases, but the solution ordinarily used was five to twenty minims of 1 in 2,000 bicyanide of mercury with 8 per cent. chemically pure sodium chloride. In some cases acoine, and in others alypin, have been used as analgesics. Dionine was occasionally added to the injection. The author lays great stress upon attention in every way to the patient's general health, and especially upon the necessity for attention to the bowels, during his period in bed. The average number of injections was five, and the average duration of treatment one month, but prolongation of the period in bed is probably beneficial if the case is one which is improving. On the other hand, if, after fourteen to twenty-one days, there are no signs of improvement, the case may be considered incurable. As soon as possible after the termination of the period of rest in bed, the patient should be sent to the country, where sometimes considerable further improvement takes place.

Next, as to the results, which are shown fully in tabular form, but reduced to their essence in the text; there were fifty cases treated, of whom twenty-seven received no benefit whatever. Of the remaining twenty-three, ten showed very decided improvement. Of these ten, five afterwards relapsed, the shortest period being two weeks and the longest four years, after conclusion of treatment; of the remaining five, three were satisfactory after one year and two were lost sight of. The other thirteen of the benefited cases showed moderate improvement; some of them

relapsed. The author's moderate views on the value of the treatment by injections may be given in his own concluding words: "The favourable cases are few, the unfavourable many; but however hopeless the latter may at first seem, it is always well, before coming to the conclusion that nothing can be done, to try the effect of such simple treatment as I have outlined. It can at least do no harm." ERNEST THOMSON.

III.—THE CORNEA.

(1) Meller, L.—Sclerosis of the cornea. (Die Sklerose der Kornea.) *Klin. Monatsbl. f. Augenheilkunde*, September, 1905.

(2) Sachsalber, A.—Corneal changes in ulcerative processes. (Hornhautveränderungen bei Geschwürsprozessen.) *Zeitschr. f. Augenheilk.*, Ergänzungsheft, 1905.

(3) Beck, A.—A clinical note on the occurrence of crystalloid deposits in the cornea. (Zur Casuistik krystallähnlicher Gebilde der Hornhaut.) *Archiv. f. Augenheilk.*, Juni, 1906.

(4) Lacaussade.—Report of a case of zona ophthalmica complicated by severe keratitis and causing suppuration of the eye. (Relation d'un cas de zona ophtalmique compliqué de kératite grave ayant amené la fonte purulente de l'œil.) *L'Ophtalmologie Provinciale*, T. III, p. 136, décembre, 1906.

(5) Monthus, A.—Keratitis interstitialis annularis. *Archives d'ophtalmologie*, février, 1907.

(6) Majewski, K. W.—A case of infraction of the cornea. (Ein Fall von Infractio corneae.) *Die Ophth. Klinik.*, März, 1907.

(7) Seefelder, R.—Clinical and anatomical contribution to the formation of peripheral groove and peripheral ectasia of the cornea. (Klinisches und anatomisches über periphere Rinnenbildung und periphere Ektasie der Hornhaut.) *Klin. Monatsbl. f. Augenheilkunde*, Mai-Juni, 1907.

(8) Fridenberg, Percy.—Pyocyaneous ulcer of the cornea. *New York Medical Journal*, June 1st, 1907.

(9) **Cuperus, N. J.—On disease of the cornea in iridocyclitis.** (**Ueber Corneakrankheit bei Iridocyclitis.**) *Arch. f. Augenheilk.*, Juni, 1907, p. 330.

(1) By sclerosis of the cornea is understood the milk-like diffuse opacity which develops gradually and without inflammatory symptoms in cases of long-standing blindness. **Meller** has had the opportunity of ascertaining the lesions which underly this white discolouration of the cornea, by examining two eyes in which blindness resulted from injuries many years ago. In the first case a dense, thick layer of connective tissue was found between Bowman's membrane and the epithelium; granulation tissue growing in from the limbus had given rise to this scar-like new formation. In several places Bowman's membrane was defective, and through these gaps the granulation tissue invaded also the corneal tissue proper. In the second case the principal changes consisted in an œdematous swelling of the corneal lamellæ, which were frequently broken up into wavy filaments and separated by dilated interspaces. This œdema accounted for a considerable thickening of the opaque cornea and was due in the last instance to an extensive lesion of the corneal endothelium. C. MARKUS.

(2) **Sachsalber** has investigated by a long series of experiments the influence which inanition and milder forms of lowered vitality have on healing processes in the cornea. He finds that under these conditions infection is much more likely to take place. There is not the same reaction to the injury, but the healing process goes on much more slowly. There are more fixed corneal corpuscles than usual, and in some cases the newly-formed scar-tissue showed a tendency to break down. A. LEVY.

(3) **Beck** describes a curious case in which the centre of the cornea was occupied by a greyish opacity which, when examined by the Zeiss binocular corneal microscope, was seen to consist of minute needles irregularly massed together in the deeper layers of the cornea. PERCIVAL J. HAY.

(4) **Lacaussade** records a case of infectious suppurative keratitis consecutive to zona ophthalmica, developing in a cachectic old woman suffering from general paralysis of the insane, and complicated by a hypopyon rapidly followed by panophthalmitis in spite of paracentesis and Sæmisch's section. He considers that the trouble was of trophic origin and due to paralysis of the fifth nerve. R. J. COULTER.

(5) **Monthus** discusses that atypical variety of interstitial keratitis first described by Vossius (*Berl. med. Woch.*, 1885, No. 43) under the name of keratitis interstitialis annularis.

Pfister had five of these cases among 130 cases of interstitial keratitis. Grunert has reported seven instances of the disease. Monthus now gives details of two cases of the kind seen at the Hôtel-Dieu, Paris. To them he adds particulars of two less typical cases, one due to tuberculosis and the other to some cause unknown. Discussing the disease generally, Monthus points to the various modifications shown by the clinical picture of the affection, the comparative slightness of pain, photophobia, and lacrymation, and the considerable interference with sight. The occurence of superficial ulcerations of the cornea is a striking feature of the cases, although not invariably present. The disease is bilateral in one-half the cases. Local treatment consists of atropine and an occlusive bandage, and general in the administration of mercury, iron, salicylates, cod-liver oil, or iodoform, according to the particular ætiological element that may be present. SYDNEY STEPHENSON.

(6) **Majewski's** patient, a doctor, received a blow in the right eye with a pair of scissors. A few hours afterwards the eye became excessively painful, and examination with a magnifying glass revealed a thin, straight line, parallel to, and a little, below the horizontal meridian of the cornea. With the ophthalmoscope, this line appeared black upon a dark background. Below it there was some haziness of the cornea. No astigmatism of the latter seemed to be present. On the day following the accident, the line appeared grey, the cornea became cloudy, and iritis set in. Two days afterwards the corneal opacity assumed a fan-like shape, spreading out from below towards the line. The patient was treated with ice, atropine, etc., and in a fortnight the condition had cleared up with the exception of the line, which remained, and was still visible five months later. The author thinks that it was produced in this way: that the cornea was depressed momentarily by the instrument, and ruptured.

PERCIVAL J. HAY.

(7) It is known that peripheral ectasia of the cornea is preceded by a thinning of the tissue. The main object of investigation is directed towards ascertaining the cause of the latter process, whether it be of an inflammatory or degenerative character (*vide* abstract of Rupprecht's and Ischreyt's papers in THE OPHTHALMOSCOPE, 1907, page 260). **Seefelder** reports four more cases of this condition; one of these is particularly interesting on account of the opportunity which offered itself of supplementing the clinical picture by an anatomical examination. A workman, aged 38, presented a typical peripheral ectasia of the right cornea, which gave rise to an inverted astigmatism of 16D. The left cornea showed along the upper margin the preliminary stage of the same condition, namely, a highly

vascularized groove limited below by a saturated white opacity. There was also a pterygium, so frequently co-existent with marginal ectasia. This eye met with a perforating wound which was covered by a conjunctival flap, but later on gave rise to sympathetic inflammation necessitating enucleation. The eye was prepared for histological examination with a special view to the demonstration of fat in the cornea. In the region of the groove the upper layers of the cornea were replaced by granulation tissue, which was evidently derived from the adjoining episcleral tissue; it was covered by corneal epithelium. The corneal layers surrounding it showed signs of marked disintegration; the lamellæ were separated by wide spaces filled with cells. They were, moreover, infiltrated with fat granules and partly transformed into wavy homogeneous bands, partly split up into fibres, or they terminated in club-shaped swellings. Fat was also found near the centre of the cornea, quite remote from the seat of the groove. The pterygium resembled histologically the granulation tissue of the groove, and like this was manifestly secondary to the degenerative changes in the cornea. As fatty degeneration forms the essential histological change in arcus senilis, the relation of this affection to peripheral ectasia is established. C. MARKUS.

(8) Infection of the superficial structures of the eye by the bacillus of blue pus, **Fridenberg** says, is an extremely rare occurrence, and in the few cases on record has led to destruction of the cornea, if not of the globe. Almost without exception, the infection is a mixed one, the usual pyogenic bacteria being present, and complicating the clinical picture. His case is of interest upon account of the bacteriologic findings and the rapid course of the disease. A pure culture of bacillus pyocyaneous was found in the conjunctival sac and in scrapings from the cornea, "the latter membrane becoming completely destroyed, in spite of the most vigorous treatment, in the course of a few days."

To sum up the interesting features of the case: There was a lack of any determinable injury. The bacillus was found in pure culture, the matter from both ulcer and conjunctival sac being otherwise sterile. There was nothing characteristic in the local conditions. The ulcerated area was of a dirty grey tint. There was no green discolouration. The course of the ulceration was rapid and malignant. There was no perforation: the cornea became shrunken and opaque, and then gave way to intra-ocular pressure. After the development of the ulcer there was no pain. "The patient did not feel cauterization with pure tincture of iodine, ordinarily quite painful, and had little or no discomfort, even from the application of the actual cautery." C. A. O.

(9) **Cuperus** has observed striæ appearing in the posterior layers of the cornea from four to seven days after the onset of iridocyclitis. They are arranged like the spokes of a wheel and may be present all round the cornea, or be limited to a portion of it. P. J. HAY.

IV.—A PECULIAR PUPIL PHENOMENON.

Markus, C.—Notes on a peculiar pupil phenomenon in cases of partial iridoplegia. *Transactions Ophthalmological Society U.K.*, 1906.

Markus describes some cases of peculiar pupil phenomena, of which the pathological significance is an open question. The essential features in the first case given were dilatation of one pupil, the other being normal, absence of direct and consensual light reflex on the affected side, presence of full accommodation, equal on both sides, presence of accommodative pupil reflex and of slow dilatation thereafter on the affected side (the accommodation being tested apart from convergence), presence of direct and consensual trigeminal pupillo-constriction reflex ; *i.e.*, pupil contraction on touching the cornea of either eye. Atropin, cocain, and eserin acted as usual. The enlarged pupil had been noticed for a year or more; there were no indications of congenital syphilis, unless the fact that the knee jerks were unaccountably absent be taken as such. The boy, aged 12, was in all other respects healthy. Two other cases are described which are similar, but differ in detail. One was a woman of 33, the other a man of 40 years. In neither were the knee jerks absent. The author, in speculating upon the ætiology of these cases, says that the possibility must be kept in view that the patients have had originally a complete iridoplegia from which they have partially recovered, and assumes, with Heddaeus, that the nerve supplying the sphincter is made up of two different sets of fibres, one arising in the sphincter nucleus and the other in the accommodation nucleus. He supposes a break in the efferent part of the light reflex arc somewhere between the centre and the termination.

A case of Lister's is referred to as exemplifying the exaggeration of the associated pupil reflex on the part of a paralysed iris. In a patient under treatment for six years for syphilitic ophthalmoplegia interna, whose left pupil is dilated and inactive to light, a maximal contraction with slow subsequent dilatation takes place when the eyelids are firmly closed.

Markus suggests that Mendel's theory that the orbicularis nerve supply is from the oculo-motor nucleus, may throw light on this phenomenon. ERNEST THOMSON.

V.—MELANOTIC PATCHES OF THE CONJUNCTIVA

Coppez, H.—The nature and mode of formation of melanotic patches of the conjunctiva accompanying melanotic tumours of the conjunctiva. (Nature et mode de formation des taches mélaniques conjonctivales accompagnant les tumeurs mélaniques de la conjonctive.) *Archives d'ophtalmologie*, février, 1907.

Pigmented conjunctival patches accompanying melanotic tumours of the conjunctiva, according to **H. Coppez,** are tolerably common, although microscopic examinations of such patches are rare.* The views of Bull, von Michel, Hochheim, Seegers, Degering, and Vennemann are quoted with reference to the nature of the histological changes present in such cases. Coppez then gives particulars of a personal observation in a woman of 61 years, who presented a small, black, pedunculated growth of the inner surface of one upper eyelid, associated with a black colouration of the corresponding ocular conjunctiva, of five years' duration. The tumour was excised (1895). Two years later (1897), another growth, which had appeared at the level of the internal angle, was excised. One year afterwards (1898), there were several black spots on the free border of the upper lid, and about the palpebral conjunctiva. Similar deposits were present in the lower lid. Again, the cornea was surrounded by a dark zone, having a width of one centimetre at its outer side, while a nodule, as large as a pea, was situated at the supero-internal part of the ocular conjunctiva. The melanosis had invaded to some extent one part of the limbus. All prominences were excised (1898). When the woman was seen two years later (1900), suffering was intense and the tumour had attained the size of a man's fist. The orbit was exenterated and the eyelids excised. The patient died in January, 1902—*i.e.*, nearly seven years after she was first seen by Coppez and about twelve years after the beginning of the melanosis. **Microscopic examination.**—(1) Melanotic conjunctival patches removed in 1897: pigment granulations were found disposed in ramifications enveloping the epithelial cells and giving the

*For two instructive cases of this kind by R. W. Doyne, see THE OPHTHALMOSCOPE, July, 1904.—S. S.

latter the same appearance as if they had been treated with silver nitrate. The epithelial cells themselves, however, contained but little pigment, although certain deeply pigmented cells were found, of which the nuclei were almost invisible. These particular cells presented pigmented prolongations, recalling those described by Vennemann (*Société française d'ophtal.*, 1898, XVI, p. 129) as analogous to the chromatophores of the lower vertebrata. The sub-epithelial connective tissue included cells of two kinds. First, a band of large round or oval cells, absolutely stuffed with pigment, without prolongations; second, smaller cells, derived from the fixed cells of the connective tissue, beginning to accrete pigment. Moreover, a number of small round sarcomatous cells, aggregated here and there into veritable neoplastic nodules, were to be found. The relationship between the pigmented cells of the epithelium and the sub-epithelial cells could scarcely be made out. At the same time the innumerable ramifications of the first-named did not penetrate into the sub-epithelial tissues. (2) Melanotic tumour of the superior cul-de-sac excised in 1897: microscopic appearance identical, but the epithelium included a number of calciform cells, the pigmented sub-epithelial cells were of a longer type, and Krause's glands were not pigmented. (3) Bulbar conjunctiva removed in 1898: few vessels, and those not modified in structure. Epithelium pigmented as in the preceding year. Most of the sarcomatous cells do not contain pigment. (4) Eyeball enucleated in 1900: the limbal growth (6mm. by 13mm.) encroaches 3mm. on the cornea and 10mm. on the sclera and is more or less lobulated and extremely vascular. A tiny pigmented sarcomatous deposit was found under Bowman's membrane at the opposite side of the cornea. (5) Eyelids: the tumour forms a compact mass half a centimetre in thickness, and penetrates to the Meibomian glands and the fibres of the orbicularis muscle.

Commenting on the above case, Coppez does not doubt that every conjunctival patch accompanying a circumscribed sarcoma of the conjunctiva represents a metastatic focus, since in each may be found characteristic sarcomatous elements. That explains the gravity of such cases, most of which end in speedy death. How are these foci formed? Are they the outcome of inoculation of sarcomatous elements shed into the conjunctival sac and absorbed by the epithelium, or, on the other hand, has transmission occurred, as in the usual way, along the vascular or lymphatic passages? To the author the first appears the more likely. The focus once constituted, pigment is formed both in the epithelium and in the sub-epithelial tissue. The nature, however, of the ramified pigmented cells of the epithelium is still to seek. Similar cells, it is to be noted, may be found in nævi.

As suggested by Vennemann (*loco citato*), they may be chromatophores existing in the normal state between the epithelial cells and stimulated to great functional activity by the absorption of sarcomatous elements by the epithelium.

SYDNEY STEPHENSON.

VI.—RECURRENT MOMENTARY BLINDNESS.

Jacqueau (Lyon). — Recurrent momentary blindness. (Cécités momentanées récidivantes.) *Lyon Médicale*, 12 mai, 1907, and *La Clinique ophtalmologique*, 25 mai, 1907.

Jacqueau has seen four cases of transitory complete blindness of recurrent type in patients who did not present the ordinary stigmata of hysteria. One of these cases he has had opportunities of studying closely, so closely indeed that he was able to make an ophthalmoscopic examination during the attack. This case was that of a young man of 22, with low myopia and slight astigmatism, who, at 12 years of age, had suffered from attacks of accommodative asthenopia which necessitated prolonged periods of rest. When aged about 18 years, after a long period of freedom from these attacks, a violent nervous crisis came on suddenly, accompanied with headache, vomiting, slight convulsive movements, and loss of consciousness for one hour. At intervals of several days, there were five more of these attacks, less severe, not accompanied by loss of consciousness, but by loss of vision for from half to one hour. After two months these attacks ceased, and were followed by attacks of binocular complete blindness and headache, both of which lasted only a few minutes. There were no prodromal symptoms. There was no hemianopia, and no cerebral disturbance. The attacks came on a dozen times a day. Examined ophthalmoscopically, there were no changes in the disc, the vessels, or the pupil reactions during an attack. Bromide of potassium had no influence. After some months the attacks entirely ceased. The patient was examined by Lépine, who could find no positive sign of hysteria, and thought there might be a cerebral tumour. This suggestion was not confirmed by the result, since the patient is now in perfect health at 22 years of age. The author relates also the case of a woman of 44, not hysterical in type, who had similar attacks in one eye, but no ophthalmoscopic examination could be made during an attack. Jacqueau discusses the cases, and will not allow them to be classed as hysterical: "Nevertheless

they were certainly nervous people, but nervous people such as one meets constantly without thinking for a moment of labelling them hysterical. . . . One is strongly tempted to say that epilepsy, ophthalmic migraine, and transitory blindness are all children belonging to the same as yet incompletely studied neuropathological family, and, from my own observations I simply conclude that one may see in people of all ages without any apparent defect, phenomena of recurrent transitory blindness of the same nature as those of ophthalmic migraine, and certainly not due to peripheral circulatory disturbance."

ERNEST THOMSON.

VII.—TUBERCULOUS AFFECTIONS OF THE EYE AND ITS APPENDAGES.

(1) Calderaro.—Clinical and anatomical observations on tuberculosis of the sclera. (Sulla tubercolosi della sclera. Osservazioni cliniche ed anatomiche.) *La Clinica Oculistica*, June and July, 1906.

(2) Cargill, L. V., and Mayou, S.—A case of general miliary tuberculosis in an adult in which choroidal tubercle with implication of one optic disc was the only physical sign in the early weeks of the illness. *Transactions Ophthalmological Society U.K.*, 1906.

(3) Mathewson, Geo. H.—Two cases of miliary tubercle of the choroid. *Montreal Medical Journal*, February, 1907.

(4) Aubineau.—Tuberculosis of the conjunctiva, vegetative form. (Tuberculose conjonctivale à forme végétante.) *L'Ophtalmologie Provinciale*, T. IV, p. 8, avril, 1907.

(5) Kraus, W. and Brückner, A. — A contribution to tubercle of the fundus. (Zur Kenntniss der Tuberculose des Augenhintergrundes.) *Arch. f. Augenheilk.*, Mai, 1907.

(6) Wirtz, R.—Clinical and pathological contribution to primary tuberculosis of the lacrymal sac. (Beitrag zur klinischen und pathologisch-anatomischen Kasuistik der primären Thränensack-Tuberkulose.) *Klin. Monatsbl. für Augenheilkunde*, Mai-Juni, 1907.

(7) **Saxl, E.**—A case of tubercle of the conjunctiva. (Ein Beitrag zur Casuistik der Tuberculose der Bindehaut. *Archiv f. Augenheilk.*, Juni, 1907, p. 328.

(1) **Calderaro** brings forward notes of three cases in which this condition was found, and gives the symptoms which may be considered as diagnostic of tubercle of the anterior sclera. In the course of the disease, he distinguishes three periods. The first or episcleral period. In this there appears in the upper lateral region a small rounded nodule, of grey colour in the central part and pinkish in the periphery. The conjunctiva is freely moveable over it and is slightly injected. In this early stage the tumour may be indistinguishable from a small parasitic cyst. In the second stage, the tumour becomes adherent to the superjacent conjunctiva and eventually this ulcerates. The floor of the ulcer is covered with small, red granulations, mixed with grey points of necrotic tissue. There are no miliary tubercles elsewhere in the conjunctiva. The sclera becomes infiltrated. The refractive media remain clear, even when the infiltration of the sclerotic has made much progress. Only in the last stages does the vitreous lose its transparency. In the final stage, the ulcer becomes clean, and slowly heals. The general course of the disease is towards healing. The scleral lesion is primitive; even when it is associated with other tuberculous manifestations, it is probably exogenous. From its tendency to spontaneous cure, treatment should be expectant, and the eye should not be excised hurredly.

HAROLD GRIMSDALE.

(2) **Cargill** and **Mayou** have reported a most interesting case in which the differential diagnosis between typhoid fever and miliary tuberculosis was clinched, if not actually made, by the finding, nine weeks before death, of the ophthalmoscopic appearances of tubercle of the choroid in one eye and of neuro-retinitis in the other eye. *Post-mortem* both lesions were proved to be tuberculous. Three well-executed coloured drawings of the ophthalmoscopic and four photomicrographs of the pathological appearances accompanying the paper. The former, however, do not seem to be arranged in their proper order, and there is a lack of textual references to the figures as they are described. The authors, while pointing out the great value of the detection of tubercle of the choroid in differential diagnosis, quote the following passage from Osler:—"Careful examination of the eyes may show choroidal tubercles, though I have never known a diagnosis made on their presence alone." The present case is therefore a rare one. ERNEST THOMSON.

(3) In two rather doubtful cases the discovery by **Mathewson**

of tubercles in the choroid led to the diagnosis of general miliary tuberculosis. S. S.

(4) **Aubineau** records the case of a woman, aged 33, without any glandular enlargement or other signs of tuberculosis, from whom he removed a multilobular tumour of the left upper eyelid in March, 1897. On microscopic examination, this appeared to consist of simple inflammatory tissue. In June, 1903, the woman returned with an ulcer on the palpebral conjunctiva of the left lower eyelid, but still without any other sign of tuberculosis. In June, 1904, the ulcer was still unhealed, and there were signs of pulmonary tuberculosis, of which the patient died a month later. Inoculation of a rabbit with tissue from the floor of the ulcer in June, 1904, caused tuberculous lesions of such an indefinite character that they could be established only when the animal had been killed, seven months after the inoculation.

R. J. COULTER.

(5) **Kraus** and **Brückner** describe two cases, which they are inclined to regard as tuberculous conditions of the fundus. The patients were a young man, *æt.* 19, and a boy, *æt.* 14. In both of them the appearance of the fundus was as follows: a large yellowish-white area near the disc, in which the retina was detached, surrounded by (1) numerous large and small yellowish-grey dots; (2) some prominent whitish-grey specks; (3) a large number of small hæmorrhages; and (4) a whitish haze merging into the normal red of the healthy retina. There was practically no pathological pigmentation of the fundus. Vitreous opacities were present. Vision became reduced to counting fingers close to the eyes. Both patients attributed their condition to trivial accidents, which the authors believe were merely instrumental in drawing the attention of the patients to the condition of their eyes. The pulmonary apices of the man were suspicious of tuberculous mischief, and his mother had died of some affection of the lungs. The boy was quite healthy, but an uncle, a grandfather, and a grandmother had died of some pulmonary complaint. By way of diagnosis and treatment injections of tuberculin were tried. They produced a general and local reaction in the man, and a local reaction in the boy. The local reaction manifested itself in an increase in the hæmorrhages and the œdema of the retina, so the injections were stopped. The authors consider that the detachment of the retina was produced by tuberculous new-formation; that the retina itself was thickened; that the yellowish dots lay partly in the deeper layers of the retina and partly in the more superficial ones; and, lastly, that the prominent whitish specks were possibly miliary tubercles. PERCIVAL J. HAY.

(6) **Wirtz's** case is interesting on account of the failure of the

microscopical examination to reveal the true nature of an enlarged lacrymal sac. A woman, aged 27, developed in the course of six months a tumour in the region of the left lacrymal sac. It had the size of a filbert and a doughy consistency. It caused epiphora, but yielded no discharge on pressure. As the preauricular glands were swollen considerably, the suspicion of tubercle was aroused and the sac excised. Nothing characteristic of a tuberculous affection was found in sections, and an authority like Prof. v. Recklinghausen thought the diagnosis rested between sarcoma and simple granulation. But material injected into the peritoneal cavity of guinea pigs caused the death of the animals from miliary tuberculosis. Recent experience has shown that so-called primary tuberculosis of the lacrymal sac is not a very rare occurrence. Several cases have been described, the tuberculous nature of which remained unsuspected until the histological examination of the excised sacs demonstrated it. Axenfeld has pointed out that a peculiar permeability of the duct for injected fluid is characteristic of a tuberculous affection.

C. MARKUS.

(7) **Saxl** describes a case of tubercle of the conjunctiva occurring in a woman, *ætat.* 23, the subject of lupus of the nose. The records cover a period of two years, *viz.*, March, 1905, to January, 1907. When the patient made her first appearance, the following were the principal features of the disease:—hypertrophy of the conjunctiva of the upper lid, with extensive papillomatous granulations and a few small nodules. There were no scars in the conjunctiva. The cornea presented old opacities. The secretion was slight and serous. The case was first treated by removing the granulations with the sharp spoon and the galvano-cautery. Tuberculin injections were commenced at the end of March and continued till May. At the beginning of April the conjunctiva was scraped a second time. In May we find a note that extensive scar formation had occurred, but in August following, the conjunctiva again presented a velvety appearance. Scraping and cauterising were resorted to once more, besides which a 2 per cent. solution of silver nitrate was applied. Tuberculin injections were renewed and continued till September. By that time more scarring had taken place. In March, 1906, there are again extensive granulations, and in January, 1907, again there is a luxuriant growth of granulations! The last note in the records is, that the granulations were scraped away once more.

PERCIVAL J. HAY.

VIII.—THE DIAGNOSIS AND TREATMENT OF TUBERCULOUS AFFECTIONS OF THE EYE.

(1) **Aubaret and Lafon.—The ophthalmo-reaction. Clinical characters of the conjunctival reaction Trials in ophthalmology.** (L'ophtalmo-réaction. Caractères cliniques de la réaction conjonctivale. Essais en ophtalmologie.) *Gazette hebdom. des Sciences Médicales de Bordeaux*, 4 août, 1907.

(2) **Brunetière.—The injection of tuberculin and the diagnosis of eye affections.** (L'injection de tuberculine et le diagnostic des affections oculaires.) *L'ophtalmologie provinciale*, septembre, 1907.

(3) **Török, Ervin.—The treatment of ocular tuberculosis with especial reference to the use of tuberculin T.R.** *Archives of Ophthalmology*, September, 1907.

(4) **Brückner, A.—Experiences with Koch's tuberculin.** (Old tuberculin and tuberculin T.R.) *Archives of Ophthalmology*, September, 1907.

(5) **Stephenson, Sydney.—The Calmette serum reaction in ophthalmology.** *British Medical Journal*, October 19, 1907.

Several communications have recently appeared dealing with the recognition and treatment of tuberculous affections of the eye. Of these, some, as those of Aubaret and Lafon and of Stephenson, describe Calmette's ophthalmo-reaction (see THE OPHTHALMOSCOPE, September and October, 1907), while the others are devoted to diagnosis and treatment by injections of tuberculin.

Brückner's experiences (4), have been obtained at the Würzburg Eye *Klinik*, where tuberculin has been used in the diagnosis of cases of doubtful etiology since the year 1903. Tuberculin T.V. and T.R. were the particular preparations selected, and they were employed by subcutaneous or intramuscular injection. Of 35 cases treated by these means, seventeen manifested a general reaction of typical nature, as shown by a rapid rise and fall in temperature in from eight to forty-eight hours after the injection had been made. Any marked disturbance of the general condition was exceptional. Brückner's results were as follows:—(1) *Interstitial keratitis.* In four cases, a positive general reaction was obtained in three. (2) *Disseminated choroiditis.* One of the two cases injected presented a very marked reaction. (3) *Iritis* and *Irido-cyclitis.*

In twelve cases of acute disease, two alone yielded a definite, general positive reaction. In fourteen cases of chronic disease, however, eleven gave a positive reaction. Where a general reaction followed the injection, general examination gave evidence of tuberculosis in seven cases, while the condition of the eye and the subsequent course made a diagnosis of tuberculosis probable in ten cases. The majority of the patients in whom the clinical picture suggested tuberculous disease of the uveal tract, therefore, reacted positively to injection. At the same time this does not prove that the eye disease is tuberculous, since a patient may suffer from tuberculous bronchial glands or other internal lesion capable of causing a reaction to tuberculin, and yet the ocular disease may be of syphilitic, rheumatic, gonorrhœal, or other origin. The sole positive proof, accordingly, is reaction of the eye itself to tuberculin, but this was obtained in three of the cases only.

Török's communication (3) is concerned more especially with the treatment of ocular tuberculosis by means of Koch's tuberculin T.R. He explains the composition of the various kinds of tuberculin, T.V., T.A., T.O., and T.R. He then describes fully the experiences of Hippel, Reunert, Dorschlag, and Wolfrum, who have obtained good results from the injection of tuberculin. Török next communicates the experiences he obtained from this method of treatment in the eye *Klinik* of the Royal Hungarian University of Science at Budapest. To begin with, tuberculin was injected in doses as small as $\frac{1}{10000}$ mgm., but as it appeared to be harmless, it was later administered exactly in accordance with V. Hippel's directions. For diagnostic purposes, one milligramme of tuberculin T.V. was injected into the inter-scapular region. On the other hand, for therapeutic purposes, tuberculin T.R. was injected, turn by turn, into the right and left upper arm. The scanty accommodation available and the necessarily prolonged nature of the treatment led to patients being cared for without confinement to hospital. Indeed, it was believed that this so-called "ambulatory" method was preferable to the other, inasmuch as it was easier for the patient to obtain fresh air, so important a factor in cure. The patients were first admitted to hospital for a week or two, in order to show them how to use the thermometer and to record the results in proper form. They were then discharged. They took their temperature at home every two hours, and noted the result in a book. They reported at the *Klinik* every second day. If the temperature rose much they remained in bed at home until such time as the fever had disappeared. Altogether, 16 cases of ocular tuberculosis were treated in this way with tuberculin T.R. The cases included tuberculosis sclerae (8),

tuberculosis conjunctivæ (5), tuberculosis iridis (2), and, finally, tuberculosis choroidæ (1). Eight of these were cured; in four there was marked improvement; and in two (1 tuberculous conjunctivitis and 1 tuberculous iritis) the treatment remained without effect. Török's experiences have convinced him that tuberculin may be used with excellent results in tuberculosis of the eye. Even if it fail to cure every case it will, if used properly and for long enough, cure the great majority of cases, including even such cases as up to the present we have been "unable to handle." It is, in any event, a treatment which it is the duty of every ophthalmologist to follow in preference to any other. Tuberculin does not appear to have any injurious effect upon tuberculosis in parts of the body other than the eye. Patients improve generally under the injections of tuberculin.

Brunetière (2) deplores the fact that the injection of tuberculin for diagnostic purposes has not been well received by French ophthalmic surgeons, although when used with proper precautions, it is free from danger. The author employs Axenfeld's formula, which is as follows:—Koch's old tuberculin, 1c.c.; carbolic acid, ½ c.c.; distilled water, 100 c.c. Of this liquid 1/10 c.c. contains one milligramme of tuberculin. Prior to injection, a general examination of the patient is made, and the temperature is taken night and morning for two days. The initial injection should never exceed one milligramme of tuberculin. According to Axenfeld, it is best administered at 11 o'clock a.m., in order to avoid any clashing between the induced reaction, on the one hand, and the evening rise in temperature so common in tuberculous subjects, on the other. The elevation in temperature which marks the reaction of the tuberculin is usually observed within 18 or 22 hours, but it may be delayed for 40 hours. If a first injection yield negative results, a second is given in two days, but the dose on this occasion should be raised to five milligrammes, *i.e.*, half a cubic centimetre of the Axenfeld solution. If a doubtful reaction follow the first injection, a second injection of one milligramme only is administered, at the end of 48 hours. If febrile reaction be not produced, a third injection of five or even ten milligrammes is given. Should this fail to produce any modification in the general state, there is strong presumptive evidence against the existence of tuberculosis. The general reaction to tuberculin is to be regarded as positive when: (1) the temperature rises at least 5 10th of a degree; and (2) a subjective reaction, as shown by headache, anorexia, and malaise, is complained of. Brunetiere thinks that the patient should be confined to bed during the process. Local reaction, in the sense that the eye shows an augmentation of any inflammatory phenomena that may exist, is rare, although

Morax (*Encyc. franç. d'oph.*, T. IV, p. 609) has pointed out that this reaction is more important from an ophthalmic point of view than any other, since a general reaction may be caused by glandular or other latent tuberculous lesions with which the ocular affection has no connection. Brunetière concludes that the tuberculin test should be applied in all cases of which the etiology is obscure.

The remaining two communications, namely, those of **Aubaret** and **Lafon** (1) and of **Stephenson** (5), deal with Calmette's ophthalmo-reaction, a method of diagnosing tubercle that promises to be no less useful in ophthalmology than in the other departments of medicine and surgery.

Aubaret and **Lafon** (1) describe, first, the clinical characters of the ophthalmo-reaction, and, secondly, its application in practical eye work. Based upon some sixty positive results, they distinguish four grades of reaction:—1, slight, lasting from twenty-four to thirty-six hours; 2, medium, lasting from two to four days; 3, intense, lasting from five to six days: and, lastly, 4, very intense, lasting eight days, or even longer. The writers have never observed keratitis, iritis, or affections of the deeper membranes of the eye follow the use of tuberculin. In severe reactions they think it is advisable to use some simple remedy for the purpose of abating the ocular symptoms. As regards the Calmette reaction in eye work, Aubaret and Lafon have employed the method in twenty-eight cases, as follows:—1. *Solitary tubercle of the choroid*, in a girl of 23 years, suffering from double dry pleurisy, but without other signs of tubercle apart from the eye. Result of tuberculin positive. 2. *Lymphatic ophthalmia.* Four cases where the lesions had healed. Results positive in each instance. 3. *Episcleritis.* Two cases, and both reacted to the tuberculin. In one of the patients pulmonary tuberculosis was present. 4. *Interstitial keratitis.* One case in a patient of 27 years, who presented no signs of either syphilis or tubercle. Nevertheless, the ophthalmo-reaction was obtained. 5. *Lacrymal affections.* Four cases, in patients aged from 35 to 71 years, all with negative results. Two cases in subjects aged respectively 11 and 19 years, both with negative results. In one of these patients it is to be noted that there was a coincident lupus of the nasal fossæ. In two other cases of valvular insufficiency of the nasal canal, the ophthalmo-reaction was not elicited. 6. *Choked disc in association with cerebral tumour.* Patient, aged 31 years, with family history of tuberculosis. Lumbar puncture yielded cerebro-spinal fluid containing some lymphocytes and much sugar. No pulmonary signs. No reaction followed the injection of 10 c.c. of a 1 : 1,000 solution of tuberculin T. R., but the Calmette reaction was nevertheless

obtained. Aubaret and Lafon believe that tuberculin can only be applied to such ocular affections as do not involve the external membranes. A retrospective diagnosis of external diseases, however, may be made by applying the tuberculin when the malady is healed. They conclude that the Calmette reaction will be of service in ophthalmology.

(5) **Stephenson** traces the history and developments of Calmette's ophthalmo-reaction, describes its application, and points to its simplicity and freedom from danger in the diagnosis of doubtful eye cases. He lays stress on the practical nature of the test. He has employed the 1 per cent. solution of dried tuberculin in upwards of thirty eye cases, the results of which may be epitomized as under:—1. *Interstitial keratitis.* Five cases presenting stigmata of inherited syphilis did not react, whereas it is significant that a positive result was obtained in three others, apparently free from syphilis. 2. *Disseminated choroiditis.* Three cases were tested in which, so far as could be ascertained, the patients were free from syphilis. In three of these the ophthalmo-reaction was obtained. 3. *Eczematous keratitis and conjunctivitis.* Positive result in all cases, 7 in number, except one. 4. *Conglomerate tubercle of iris and ciliary body.* One case with positive result. General examination, including use of X-rays, negative.* 5. *Tubercle of cornea* in a girl, 12 years of age, free, as far as could be ascertained, from tuberculous foci. Family history of tubercle. Positive results obtained with Koch's tuberculin T.R. (third injection). Ophthalmo-reaction positive. 6. *Episcleritis.* Three cases in women, recurrent. One positive result in a patient whose cervical, inguinal, and axillary glands were enlarged. 7. *Irido-cyclitis.* Two cases, both of which reacted. One of these patients presented articular signs of tubercle. The other developed a tubercle of the choroid whilst under observation. 8. Negative results obtained in *buphthalmos, squint*, etc. Stephenson concludes that Professor Calmette has placed in our hands a simple, trustworthy, efficient, and economical means of recognizing the existence of tubercle in any part of a patient's economy. He is persuaded that by the systematic employment of the serum advance will be made in our knowledge of the ætiology of certain affections of the eye.

SYDNEY STEPHENSON.

* An enlarged gland on left side of neck, however, may have been tuberculous.

IX.—CYCLOPLEGICS AND ERRORS OF REFRACTION.

(1) **Gonzalez, José de Jesus.—Indications for the cycloplegics in determining defects of refraction.** *Anales de Oftalmologia*, April, 1906.

(2) **Troncoso, Manuel Uribe y.—Indications for cycloplegics for determining ocular refraction.** *Anales des Oftalmologia*, May, 1906.

(1) **Gonzalez** condenses his views in the following conclusions: to determine correctly an ametropia, cycloplegics should be applied: first, to hypermetropes, less than 35 years old; secondly, to astigmatic persons of the same age; thirdly, to myopic persons who suffer from spasm of the accommodation, also to nervous and excitable persons. We need not use cycloplegics: first, for ametropes over 35 years old; secondly, for hypermetropes attacked with paresis of accommodation; thirdly, for the shortsighted who have no accommodative spasm. No subjective examination of refraction should be made under the influence of cycloplegics.

M. URIBE Y TRONCOSO.

(2) **Troncoso** recommends cycloplegics for children with mixed astigmatism where spasm of the accommodation is suspected; in slight myopia; for hypermetropes, especially children who suffer from strabismus, but for adults he does not think them absolutely necessary, but considers a gradual correction better, limiting oneself to correcting the manifest hypermetropia.

He gives statistics of 1,000 cases among his private patients, in which the refraction has been carefully studied and measured—first, with the ophthalmometer, then, by skiascopy, and, lastly, by a subjective examination. In the 1,000 cases cycloplegics were used in the proportion of 17·9 per cent. In 80 per cent. they were not used. The former give in detail: pure myopia, 10·90 per cent.; simple myopic astigmatism, 23·19 per cent.; compound myopic astigmatism, 16·06 per cent.; pure hypermetropia 7.07 per cent.; simple hypermetropic astigmatism, 19 per cent.; compound hypermetropic astigmatism, 22·4 per cent.; mixed astigmatism, 38·5 per cent. M. URIBE Y TRONCOSO.

X.—SYPHILITIC AFFECTIONS OF THE CONJUNCTIVA.

(1) **Le Roux.—Syphilitic gummata of the conjunctiva. (Gommes syphilitiques de la conjonctive.)** *L'Ophtalmologie Provinciale*, T. II, p. 139, décembre, 1905.

(2) **Sauvineau.—Syphilitic chancre of the bulbar conjunctiva. (Chancre syphilitique de la conjonctive bulbaire.)** *Ann. d'oculistique*, T. CXXXV, p. 390, mai, 1906.

(1) **Le Roux** records the case of a woman, aged 30 years, without any history or stigmata of syphilis, who developed in succession, at short intervals, (1) severe neuralgia of the ophthalmic branch of the left fifth nerve; (2) ophthalmoplegia interna in both eyes, lasting three weeks; (3) severe neuralgia of the ophthalmic branch of the right fifth nerve, accompanied by (4) a swelling the size of a pea over the lower part of the eyeball.

Under antisyphilitic treatment, the pain was relieved and the gumma disappeared; but on interrupting the treatment, the pain recurred, the eye became again injected, and the upper lid swollen from syphilitic tarsitis. Under renewed antisyphilitic treatment, the symptoms were rapidly relieved, and the eye became practically normal in a fortnight. The author discusses the literature of the subject.

(2) **Sauvineau's** patient, a man aged 44 years, got some plaster from a ceiling into his left eye. This caused slight inflammation, which was practically cured in two or three days; but a few days later fresh inflammatory symptoms developed, as a result of which the man consulted an oculist ten days after the accident, when he was found to have redness and œdema of the inner half of each eyelid, with abundant purulent secretion and much chemosis, raising the conjunctiva round the nasal side of the cornea into a hard, non-painful pad, on the surface of which, near the caruncle, was a shallow triangular suppurating opening, shaped like a leech bite. No fragment of plaster or other such *débris* could be found in the ulcer. The eyeball and vision were unaffected and there was no pain, but there was an enlarged, movable, painless gland in the submaxillary region. In spite of treatment with nitrate of silver, the condition of the eye did not improve, but the ulceration increased in size and became situated on the surface of a definite indurated *plateau*, which was movable on the surface of the eyeball. The diagnosis of chancre of the bulbar conjunctiva was confirmed by the appearance of secondary syphilitic symptoms, and by the disappearance of the conjunctival ulceration and chemosis without local treat-

ment, leaving a characteristic induration. From a medico-legal point of view, the case is interesting, as, owing to the short interval between the accident and the development of the chancre, the man was not entitled to any compensation.

R. J. COULTER.

XI.—PARALYSIS OF OCULAR MUSCLES.

(1) Isakowitz, J.—A case of bilateral traumatic paralysis of the 6th nerve. (Ein Fall von doppelseitiger traumatischer Abducens-Lähmung.) *Zeitschr. f. Augenh.*, Juli, 1906.

(2) Rouvillois, M.—Abducens paralysis: a symptom of fracture of the petrous-temporal bone, the result of injury to the skull. (Paralysie du moteur oculaire externe symptomatique d'une fracture du rocher consécutive a un traumatisme du crane.) *Recueil d'ophtalmologie*, juillet, 1906.

(3) Terson (Toulouse) and A. Terson (Paris).—Paralysis of the external oculo-motor in the course of otitis. (La paralysie du moteur oculaire externe au cours des otites.) *Ann. d'oculistique*, T. CXXXVI, p. 16, juillet, 1906.

(4) Brückner, A.—Transient paresis of single ocular muscles. (Flüchtige Paresen enizelner Augenmuskeln.) *Archiv. f. Augenheilk.*, August, 1906.

(1) **Isakowitz** recounts the case of a man who fell backwards on to a hard pavement, striking the back of his head. There was no unconsciousness but some slight bleeding from the nose. After a few hours he was quite well again and resumed his work. Two days later he suddenly developed double vision and could not turn his eyes outwards. On examination, both external recti were paralysed, neither eye moving outwards beyond the middle line. No other abnormality could be found. The left muscle improved slightly in the course of the following three months, the right not at all. In discussing the situation of the possible lesion, he excludes nuclear change, on account of the escape of the 7th, and comes to the conclusion that the most likely thing was a haemorrhage on the clivus at the junction of the sphenoid and occipital bones where the nerves are quite close to each other and in relationship to the anterior and posterior inferior cerebellar arteries. A. LEVY.

(2) **Rouvillois** records the case of a man, *æt.* 40 years, who was thrown from his bicycle over a parapet and fell on his head eight or nine metres below. He was unconscious for a week, but showed no evidence of external injury beyond superficial contusions of the face, particularly the left side, thorax, and limbs. On subsidence of ecchymosis it was found that he had a paralytic convergent squint on the left side, which was associated at first with diplopia and later with false orientation and severe headache. There was possibly some slight weakness of the obliques on the same side, and for about a month there was some difficulty in whistling and the tongue was protruded slightly to the right side, but there was complete absence of classical symptoms of fractured skull. The diagnosis was paralysis of the left 6th nerve; the lesion being distal to the nucleus. The exact seat of the lesion is given as the point where the abducens turns round the point of the petrous temporal and rests on the periosteum. The bony lesion would probably be a tearing of the point of the petrous bone by the petro-occipital ligament (Felizet) or a gliding of the petrous summit on the apophysis basilaris (Panas). The treatment consisted in the relief of symptoms. The headache was relieved by wearing a shade, and the administration of potassium iodide and the use of the continuous current J. JAMESON EVANS.

(3) **Terson** (of Toulouse) and **A. Terson** (of Paris) report two cases of purulent otitis complicated by paralysis of the 6th nerve on the same side, which recovered completely. They quote several similar cases recorded by other observers, most of which also recovered, even when complicated by double optic neuritis, and consider that the paralysis is probably of infective origin and not reflex, and that the venous, lymphatic, and connective tissue connections between the middle ear and the 6th nerve through the carotid artery and its canal explain its relative frequency. R. J. COULTER.

(4) **Brückner** relates two cases of transient paresis, the first one a paresis of the right inferior rectus, which lasted three quarters of an hour; the second, a paresis of the right superior oblique, which passed off in a day. PERCIVAL J. HAY.

REVIEWS.

Sur l'Emploi du Collargol dans les Affections des Membranes externes de l'Œil. Par JULES CHEVALIER. Paris: Imprimerie de la Faculté de Médecine. 1906.

This is a thesis for the doctorate of medicine. In it are

included accounts of collargol, considered as to its physical and chemical properties, mode of preparation, physiological properties, toxicity, mode of action, and chapters on its use in conjunctivitis and ophthalmia, keratitis, and panophthalmitis. The thesis is in the main a compilation of the work of others. The bibliography contains sixty names. E. T.

Thèse pour le Doctorate en Médecine: Complications et Conséquences tardives des Décollements de la Retine. (Thesis for the M.D. degree: On the Complications and Sequelæ of Detachment of the Retina.) Par HENRI RAOULX. Paris: A. Maloine, Editeur, 25, Rue de l'École-de-Médecine. 1907.

In this thesis the author first discusses the complications that have been observed in cases of detachment of the retina, which, he remarks, though noted in particular cases, have not been hitherto properly and collectively considered. Those which have been most frequently observed are iritis, with or without cyclitis, irido-choroiditis, glaucoma, and cataract. Iritis may be induced by the too rigorous employment of a mode of treatment sometimes adopted in cases of retinal detachment, consisting in the application of a compressive bandage; and if the patient be gouty, rheumatic, or syphilitic, it may lead to posterior synechiæ, exudations into the anterior chamber, hypopyon, and hyphæma. Nordenson, in 117 cases of retinal detachment, met with 17 cases of iritis and three of irido-cyclitis. Raoulx, in 10 cases, found one of iritis and two of irido-cyclitis. Iritis usually occurs at an early period—that is, between the first and the eighth week after the detachment. When it makes its appearance early, it is usually benign in character, and can be reduced by atropin and warm compresses. At a later period it is more serious. In regard to cyclitis, recovery may take place under vigorous treatment, but more commonly recurrences are observed, accompanied by great pain and followed by cataract and atrophy of the globe. Occasionally sympathetic ophthalmitis has been recorded. Irido-choroiditis, leading to blindness and phthisis oculi, are very constantly seen in cases of myopia associated with detachment of the retina. As a rule, the tension of the globe is lowered in cases of detachment, except when this condition is the result of a tumour, of which augmented tension must then be regarded as an indication. Glaucoma has been observed to supervene on an electrolysis, but it is rare, and generally follows the detachment at an interval of some weeks or months. It is then the result of these secondary conditions established by, for example, irido-choroiditis, which has occluded the irido-corneal angle. The

prognosis is very bad. In nine cases of glaucoma, three were enucleated in consequence of the pain being insupportable, two became amaurotic; these could scarcely recognise movements of the hand, and the rest could only count the fingers at 20 centimetres.

In regard to cataract, Gros saw it frequently, but the proportion of cases is not specified in 170 cases of detached retina. Nordenson records 17 cataracts in 126 cases of detachment, Hartmann 7 in 19, whilst in 6 others of the 17 there was phthisis of the globe. Cataract, which is usually preceded by iritis or other inflammatory conditions, is a late event in the history of detachment. In one case it appeared at the end of eight months, four times at the expiration of five years, three times at the end of seven years, and in one case after 20 years; perhaps six years may be taken as the average.

Amongst the less frequent complications of retinal detachment are hæmorrhages. These appear to be due in some instances to the treatment adopted, such as electrolysis, whilst in others they result from the general condition of the system In one case hæmorrhage occurred five days after puncture of globe, in another it occurred after the injection, subconjunctivally, of saline solutions of excessive strength.

Raoulx discusses the various modes of treatment that have been suggested, dividing them into the two groups of medical and surgical. Under the former he includes collyria, atropin, cocain, and eserine. Under the latter, electrolysis, subconjunctival injections, puncture of the sclerotic, iridectomy, intraocular injections of tincture of iodine, drainage, and the plan recommended by Deutschmann. In addition to these are mechanical treatment, such as compression, and rest in the recumbent position; antispecific treatment as by mercurial friction, hypodermic mercurial injections, and injections of potassium iodide, and, finally, revulsive treatment or treatment by ignipuncture.

Guaita has obtained good results from the instillation of solutions of eserine, of the strength of 5-7 grains per ounce of water. Samelson, Lubinski, and Norstmann have been satisfied with a compressive bandage, but de Wecker and Lapersonne have seen iritis follow its use. It should, therefore, be cautiously applied and combined with the horizontal position, especially when the detachment is recent. The same may be said of ignipuncture, proposed by de Wecker. Electrolysis seems to be a more than doubtful remedy. Terson, who adopted this method in twelve cases, had in one case aggravation of the symptoms; in two cases no results; in three transient improvement; in the remaining cases permanent amelioration. Acute glaucoma

followed electrolysis in one case recorded by Montgomery, of Chicago. The results of deep subconjunctival injections of salt or of salt and sugar, are unsatisfactory. They are probably only serviceable in recent traumatic cases, where recovery would probably have taken place without treatment of any kind except rest. Scleral puncture with aspiration was practised by de Wecker, but with results that led him to revert to simple puncture, as recommended by v. Graefe and Bowman. Iridectomy has proved unsuccessful in many cases, and is seldom satisfactory in its results.

The injection of one or two drops of tincture of iodine into the retinal pouch proved very generally unsuccessful in the hands of Galezowski, but Schœler obtained good results from the injection of tincture of iodine, diluted with an equal quantity of water and a small proportion of potassium iodide. This observer claims to have had, in 28 cases, five recoveries, and three cases in which there was amelioration. Intra-scleral drainage has been tried by de Wecker, an aseptic thread of gold being passed through the sclerotic and left in position, but the method has been abandoned by the author. The method of treatment proposed by Deutschmann is an heroic one, and consists in free division of the vitreous, followed by the injection of the vitreous of the rabbit, but in Raoulx's opinion is not to be recommended. The general condition of the system should not be overlooked, whether the result of infection or of a diathesis. Myopia, for example, which so often leads to detachment of the retina as de Lapersonne has shown, is frequently caused by syphilis. Arthritic conditions, rheumatism and gout, and diabetes, and, perhaps, saturnism, diabetes, and paludism are commonly associated with it, and at all events deserve attention and appropriate treatment. More or less complete details of 31 cases are given, many being from the author's case-book.

HENRY POWER.

NOTES AND ECHOES.

Obituary.

DR. GOTTLIEB E. JAESCHE died on August 9th last in his 86th year. He was a pupil of v. Graefe, v. Arlt, and Desmarres. He practised ophthalmology in Moscow from 1859 to 1873, when he moved to Dorpat, where he died after a long illness. Throughout his long career Jaesche evinced great interest in all subjects connected with general science.

* * * *

Appointments and Honours.

PROFESSOR HESS, who, as readers will remember, was offered the Chair of Ophthalmology at Strasburg, but who preferred to remain at Würzburg, has just received the title of Aulic Counsellor. Dr. Carlos Finlay has been appointed Professor of Ophthalmology in the University of Havana. Dr. Paul Römer, Hess's first assistant at Würzburg, has been offered the Directorship of the University Eye Klinik, as successor to Dr. L. Heine, who has been promoted to Kiel.

* * * *

Homœopathic Eye, Ear and Throat Journal.

ONE of the most naïve things we ever remember to have read is the following editorial announcement in the September number of the *Homœopathic Eye, Ear, and Throat Journal*, published at Lancaster, Pa., and New York:—

EDITORIAL.

DOLCE FAR NIENTE.

We left town for our vacation with brave intentions as to an editorial for September, but the hot weather and the relaxing effect of the hammock have led us to ask the indulgence of our readers.

* * * *

The Queen of Roumania and the Blind.

AN interesting announcement was made by the Queen Elizabeth of Roumania to the Congress of Teachers of the Blind recently held at Hamburg. Her Majesty announced that, in addition to the blind asylum she has already founded, she is establishing a colony in which all the blind folk of Roumania will be united.

* * * *

The Ophthalmological Society.

AT the meeting of the Ophthalmological Society, held on October 17th last, the incoming President, Mr. R. Marcus Gunn, delivered an introductory address, taking as his subject the history and developments and work of the Society. A crowded meeting listened attentively to Mr. Gunn's lucid address.

* * * *

Dublin Opticians and the Victoria Eye Hospital.

A PRETTY squabble is brewing between the authorities of the Royal Victoria Eye and Ear Hospital, Dublin, on the one hand, and the local opticians, on the other. From a recent report in the *Freeman's Journal*, it appears that the Surgeons to the Hospital insist that prescriptions for glasses shall

be filled by one optician alone, whereas, formerly, the patients might buy their spectacles where they listed. As some 40,000 patients pass through the portals of the Hospital every year, the question is one of some consequence to those immediately concerned. The Irish Optical Association, so it is stated, have a promise of ample funds for the purpose of founding a rival institution, especially suitable for those of limited means. They threaten this as retaliation in case the hospital authorities continue the present monopoly.

* * * *

A Re-echo of Professor Osler.

THE following paragraph, taken from our contemporary, *The Ophthalmic Record* (Chicago), is reminiscent of an utterance ascribed popularly to Professor Osler, although repeatedly denied by that distinguished exponent of all things, medical and otherwise. The paragraph is as follows:—"Miss Minnie E. Hicks, of Galena, Maryland, has some startling views upon the subject of the blind, one of which is that particularly the very ignorant blind should either be educated or chloroformed, especially if they have become blind in adult life." Miss Hicks' sentiments are evidently more scientific than humane.

* * * *

Mr. W. H. H. Jessop.

READERS will be glad to learn that Mr. Jessop, Ophthalmic Surgeon to St. Bartholomew's Hospital, London, has now quite recovered from the effects of his recent serious motor accident.

* * * *

Hirschberg's Klinik.

THE house at 36, Karlstrasse, Berlin, familiar to many English and American ophthalmic surgeons, where Professor Hirschberg has conducted his *Augenklinik* for the last thirty-five years, has been pulled down. A new building, designed upon modern lines, is in process of construction, and the *Klinik* in future will be under the joint direction of Professor Hirschberg and Dr. Wilhelm Mühsam. We have to condole with Professor Hirschberg upon the grievous loss he has sustained in the death of Frau Hirschberg.

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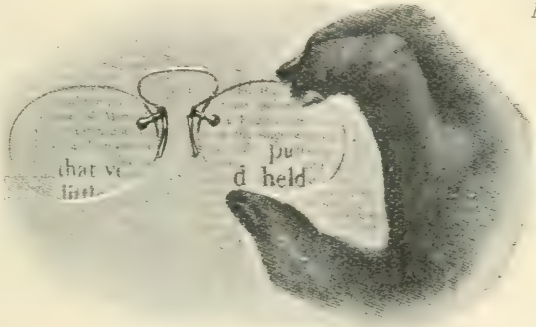

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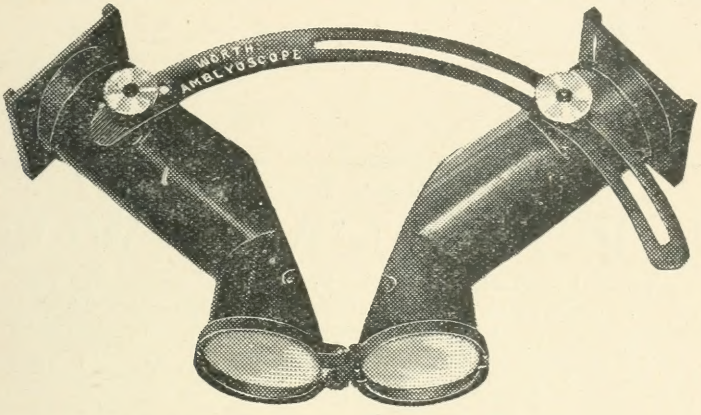

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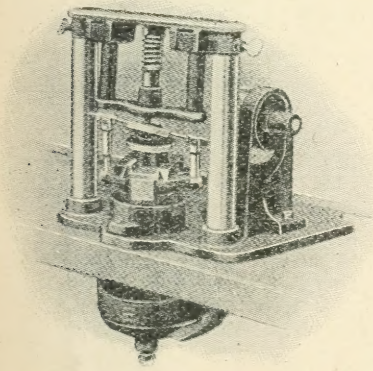

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